

# Houghton Mifflin Mathematics 4

## Teacher's Resource Book



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# Houghton Mifflin Mathematics 4

## Teacher's Resource Book

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# Houghton Mifflin Mathematics

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# Introduction

## Development

*Houghton Mifflin Mathematics* is developed in six strands: **Numeration, Arithmetic, Geometry, Measurement, Graphing** and **Problem Solving**. The first five strands are treated in a *block* approach. Fourteen 24-page units are devoted to the strands. This allows for continuity and easier reinforcement and retention of mathematical skills. Problem Solving is an integral part of the entire program and is treated within all of the five other strands. (See *Problem Solving*.)

A typical unit of *Houghton Mifflin Mathematics* contains ten lessons, each on a two-page layout. Each lesson treats only one objective. The objectives are numbered by a computer code to allow easy tracking of skills for reinforcement and remediation. (See *Learning Objectives*, Page T13.) This approach provides learning in “bite-sized bits” to ensure students master the objective before proceeding to the next level of difficulty.

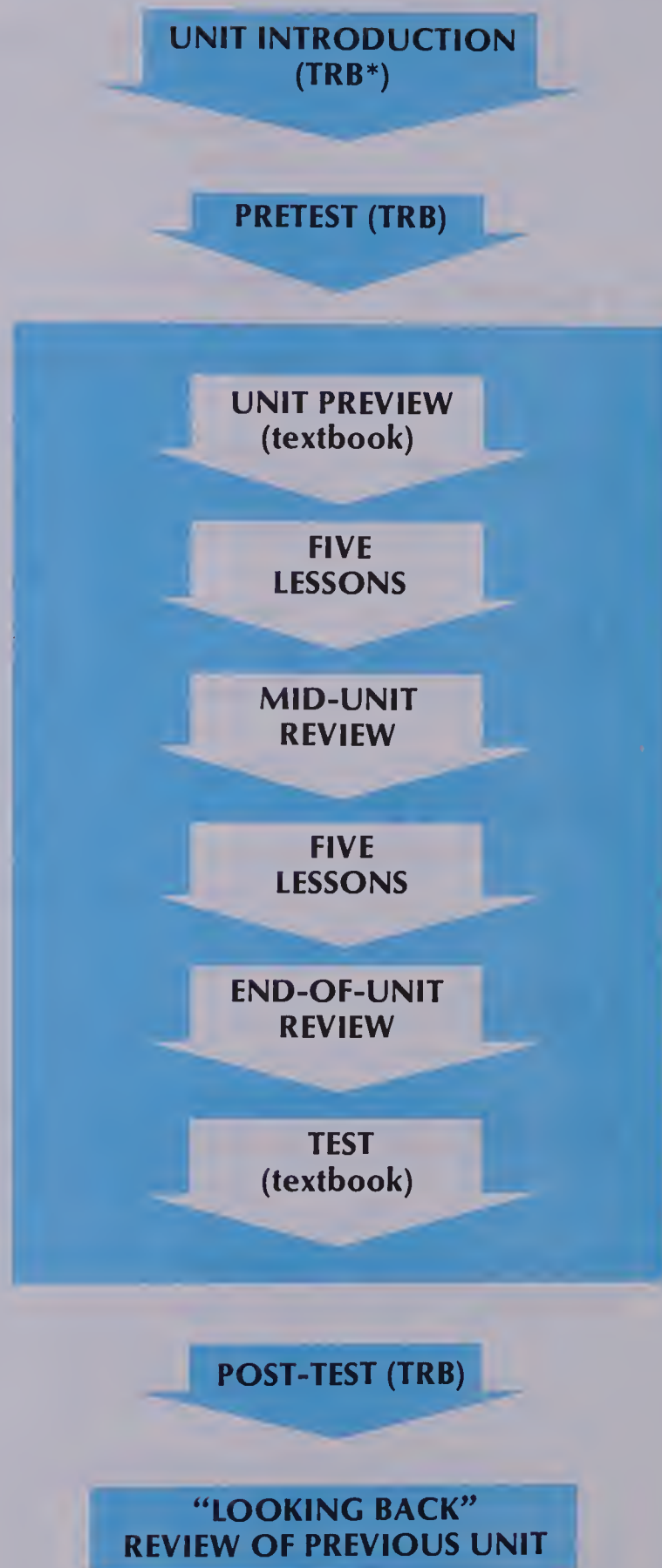
## Organization

A typical unit of *Houghton Mifflin Mathematics* follows the sequence shown in the flow chart.

The Introduction in the TRB (Teacher’s Resource Book) will give some mathematical and pedagogical background to the unit. As well, the *Ideas* section provides some useful suggestions for integrating the theme and/or other subject areas with the mathematical content of the unit.

The “Preview” is simply a practice page that reviews some prerequisite skill that will be needed for success in the core lessons of the unit. The lessons are organized in two sections with a mini-review after each section. The “Looking Back” page provides practice in the main strand of the previous unit.

A typical unit will take about three weeks including introductory activities, lessons, reviews, and tests. This allows one day for most lessons. It may be suggested that more time be spent on certain important or difficult topics. Enriched classes may cover a unit in two weeks, while others may take four or more weeks.



\*Teacher’s Resource Book



# Review and Testing

The authors of *Houghton Mifflin Mathematics* recognize the importance of skill reinforcement so that students remember what they have been taught from week to week and from year to year. The textbook and *Teacher's Resource Book* have been designed to provide sufficient review and testing resources at the times when they will be most useful. The program contains the following features.

1. An optional **Pretest** in the TRB. This will be especially useful early in the school year to place your students' ability. However, some students may have already learned some later topics in different strands, so the pretest may be used with discretion throughout the school year. Once the level of the students' ability has been placed, the pretest may still be used as a practice sheet or an extra post-test.

2. A **mid-unit Review** provides practice in all the objectives covered in the first half of a unit. As with all testing material, the questions are clearly labelled by objective. A chart in the TRB pinpoints the lesson and page number where the skill can be reviewed if necessary.

3. An **end-of-unit Review** provides practice in all the objectives of the second half of the unit and has the same diagnostic features as the mid-unit Review.

4. The **Test** in the textbook provides clusters of questions on each objective. The test may be assigned simply for extra practice.

5. A **Post-test** is reproduced in the TRB and has the advantage that the students have had no prior access to it.

6. The **Looking Back** at the end of each unit provides extra practice and reinforcement in the strand covered by the previous unit.

7. **Extra Practice** is available for every lesson in Houghton Mifflin's Testing and Practice Masters. The half-page black-line masters are reproduced with answers in the TRB.

8. **Cumulative Tests** for groups of units are provided in the back of the textbook.

9. The back pages of the textbook also provide **Extra Practice** in core objectives of the grade level.

None \_\_\_\_\_

**Unit 2**

**Pretest**

Add or subtract

1. $\begin{array}{r} 6 \\ + 6 \\ \hline \end{array}$	2. $\begin{array}{r} 11 \\ - 8 \\ \hline \end{array}$	3. $\begin{array}{r} 7 \\ + 7 \\ \hline \end{array}$	4. $\begin{array}{r} 8 \\ + 9 \\ \hline \end{array}$	5. $\begin{array}{r} 15 \\ - 6 \\ \hline \end{array}$
--	---	--	--	---

6.  $5 + 8 =$     7.  $4 + 9 =$     8.  $10 - 7 =$     9.  $18 - 9 =$

10. $\begin{array}{r} 41 \\ + 26 \\ \hline \end{array}$	11. $\begin{array}{r} 92 \\ + 7 \\ \hline \end{array}$	12. $\begin{array}{r} 35 \\ - 12 \\ \hline \end{array}$	13. $\begin{array}{r} 87 \\ - 36 \\ \hline \end{array}$	14. $\begin{array}{r} 48 \\ - 18 \\ \hline \end{array}$
---	--	---	---	---

15. $\begin{array}{r} 27 \\ + 9 \\ \hline \end{array}$	16. $\begin{array}{r} 43 \\ + 8 \\ \hline \end{array}$	17. $\begin{array}{r} 25 \\ + 5 \\ \hline \end{array}$	18. $\begin{array}{r} 36 \\ - 7 \\ \hline \end{array}$	19. $\begin{array}{r} 51 \\ - 4 \\ \hline \end{array}$
--	--	--	--	--

20. **REVIEW**

Add

1. $\begin{array}{r} 7 \\ + 6 \\ \hline \end{array}$	2. $\begin{array}{r} 2 \\ + 9 \\ \hline \end{array}$	3. $\begin{array}{r} 5 \\ + 7 \\ \hline \end{array}$	4. $\begin{array}{r} 8 \\ + 5 \\ \hline \end{array}$	5. $\begin{array}{r} 6 \\ + 4 \\ \hline \end{array}$
--	--	--	--	--

25. 5    27. 76    29. **REVIEW**

Solve

34. E    35. 5    36. Jo had

H    B    How r

T    A6    A7    A8

**TEST**    **UNIT 2**

Add or subtract

None \_\_\_\_\_

**Post-test**    **Unit 2**

Add or subtract

1. $\begin{array}{r} 7 \\ + 5 \\ \hline \end{array}$	2. $\begin{array}{r} 4 \\ + 6 \\ \hline \end{array}$	3. $\begin{array}{r} 8 \\ + 7 \\ \hline \end{array}$	4. $\begin{array}{r} 15 \\ - 9 \\ \hline \end{array}$	5. $\begin{array}{r} 16 \\ - 7 \\ \hline \end{array}$
--	--	--	---	---

6.  $5 + 9 =$     7.  $9 + 7 =$     8.  $12 - 6 =$     9.  $17 - 8 =$

**LOOKING BACK**    **ADD / SUBTRACT**

Add

1. $\begin{array}{r} 3 \\ + 5 \\ \hline \end{array}$	2. $\begin{array}{r} 24 \\ + 4 \\ \hline \end{array}$	3. $\begin{array}{r} 53 \\ + 44 \\ \hline \end{array}$	4. $\begin{array}{r} 430 \\ + 19 \\ \hline \end{array}$	5. $\begin{array}{r} 503 \\ + 184 \\ \hline \end{array}$
--	---	--	---	--

6. $\begin{array}{r} 9 \\ + 6 \\ \hline \end{array}$	7. $\begin{array}{r} 47 \\ + 6 \\ \hline \end{array}$	8. $\begin{array}{r} 25 \\ + 36 \\ \hline \end{array}$	9. $\begin{array}{r} 854 \\ + 29 \\ \hline \end{array}$	10. $\begin{array}{r} 626 \\ + 137 \\ \hline \end{array}$
--	---	--	---	---

11. $\begin{array}{r} 70 \\ + 89 \\ \hline \end{array}$	12. $\begin{array}{r} 64 \\ + 58 \\ \hline \end{array}$	13. $\begin{array}{r} 714 \\ + 97 \\ \hline \end{array}$	14. $\begin{array}{r} 507 \\ + 197 \\ \hline \end{array}$	15. $\begin{array}{r} 618 \\ + 294 \\ \hline \end{array}$
---	---	--	---	---

16. $\begin{array}{r} 1604 \\ + 163 \\ \hline \end{array}$	17. $\begin{array}{r} 8563 \\ + 218 \\ \hline \end{array}$	18. $\begin{array}{r} 5119 \\ + 3467 \\ \hline \end{array}$	19. $\begin{array}{r} 3669 \\ + 4054 \\ \hline \end{array}$	20. $\begin{array}{r} 2758 \\ + 2758 \\ \hline \end{array}$
--	--	---	---	---

None \_\_\_\_\_

**Extra Practice**    **Worksheet A1**

Add or subtract

**Cumulative Test**    **UNITS 1-4**

**Addition**

Cop

1. $\begin{array}{r} 8 \\ + 0 \\ \hline \end{array}$	2. $\begin{array}{r} 9 \\ + 4 \\ \hline \end{array}$	3. $\begin{array}{r} 6 \\ + 7 \\ \hline \end{array}$	4. $\begin{array}{r} 3 \\ + 5 \\ \hline \end{array}$	5. $\begin{array}{r} 8 \\ + 9 \\ \hline \end{array}$
--	--	--	--	--

Wri

6. $9 + 7$	7. $3 + 8$	8. $4 + 5$	9. $6 + 8$	10. $7 + 9$
------------	------------	------------	------------	-------------

11.  $\begin{array}{r} 30 \\ + 2 \\ \hline \end{array}$     12.  $\begin{array}{r} 74 \\ + 6 \\ \hline \end{array}$     13.  $\begin{array}{r} 58 \\ + 7 \\ \hline \end{array}$     14.  $\begin{array}{r} 56 \\ + 5 \\ \hline \end{array}$     15.  $\begin{array}{r} 9 \\ + 36 \\ \hline \end{array}$

Wri

16. $\begin{array}{r} 36 \\ + 51 \\ \hline \end{array}$	17. $\begin{array}{r} 46 \\ + 27 \\ \hline \end{array}$	18. $\begin{array}{r} 62 \\ + 24 \\ \hline \end{array}$	19. $\begin{array}{r} 58 \\ + 33 \\ \hline \end{array}$	20. $\begin{array}{r} 74 \\ + 36 \\ \hline \end{array}$
---	---	---	---	---

Rou

21. $\begin{array}{r} 4 \\ + 7 \\ \hline \end{array}$	22. $\begin{array}{r} 8 \\ + 2 \\ \hline \end{array}$	23. $\begin{array}{r} 24 \\ + 14 \\ \hline \end{array}$	24. $\begin{array}{r} 16 \\ + 22 \\ \hline \end{array}$	25. $\begin{array}{r} 356 \\ + 194 \\ \hline \end{array}$
---	---	---	---	---

14.  $\begin{array}{r} 2 \\ + 7 \\ \hline \end{array}$     17.  $\begin{array}{r} 3 \\ + 2 \\ \hline \end{array}$     23.  $\begin{array}{r} 14 \\ + 41 \\ \hline \end{array}$     24.  $\begin{array}{r} 53 \\ + 22 \\ \hline \end{array}$     25.  $\begin{array}{r} 213 \\ + 194 \\ \hline \end{array}$

Add

26. $\begin{array}{r} 416 \\ + 5 \\ \hline \end{array}$	27. $\begin{array}{r} 607 \\ + 8 \\ \hline \end{array}$	28. $\begin{array}{r} 86 \\ + 254 \\ \hline \end{array}$	29. $\begin{array}{r} 846 \\ + 57 \\ \hline \end{array}$	30. $\begin{array}{r} 65 \\ + 238 \\ \hline \end{array}$
---	---	--	--	--

22.  $\begin{array}{r} 407 \\ + 305 \\ \hline \end{array}$     32.  $\begin{array}{r} 174 \\ + 237 \\ \hline \end{array}$     33.  $\begin{array}{r} 335 \\ + 176 \\ \hline \end{array}$     34.  $\begin{array}{r} 218 \\ + 362 \\ \hline \end{array}$     35.  $\begin{array}{r} 699 \\ + 105 \\ \hline \end{array}$

27.  $\begin{array}{r} 3857 \\ + 153 \\ \hline \end{array}$     37.  $\begin{array}{r} 643 \\ + 1228 \\ \hline \end{array}$     38.  $\begin{array}{r} 574 \\ + 3268 \\ \hline \end{array}$     39.  $\begin{array}{r} 4369 \\ + 138 \\ \hline \end{array}$     40.  $\begin{array}{r} 507 \\ + 4197 \\ \hline \end{array}$

Sol

41. $\begin{array}{r} 3594 \\ + 5609 \\ \hline \end{array}$	42. $\begin{array}{r} 2788 \\ + 2585 \\ \hline \end{array}$	43. $\begin{array}{r} 6487 \\ + 1036 \\ \hline \end{array}$	44. $\begin{array}{r} 3296 \\ + 5917 \\ \hline \end{array}$	45. $\begin{array}{r} 3897 \\ + 5984 \\ \hline \end{array}$
---	---	---	---	---

32.  $\begin{array}{r} 04 \\ + 03 \\ \hline \end{array}$     47.  $\begin{array}{r} 08 \\ + 05 \\ \hline \end{array}$     48.  $\begin{array}{r} 69 \\ + 47 \\ \hline \end{array}$     49.  $\begin{array}{r} 143 \\ + 89 \\ \hline \end{array}$     50.  $\begin{array}{r} 9732 \\ + 18767 \\ \hline \end{array}$

51.  $09 + 07$     52.  $418 + 27$     53.  $1894 + 85$

## Problem Solving

Problem Solving is an area of study receiving increased emphasis in the elementary mathematics curriculum. It is not enough for students simply to master basic mathematical skills. In today's world, they must be able to apply those skills to solve practical, real-world problems.

The first step in this process involves interpretation of simple, routine problem situations, given first in pictures, then in words. Beyond that, a complete mathematics program must give the students an armoury of strategies with which to attack all types of problems, routine and non-routine. Such strategies include drawing diagrams, guesswork, using a model, estimation, looking for patterns, making lists, simplifying or rewording the problem, and many more. In addition, *Houghton Mifflin Mathematics* teaches a simple four-step strategy for attacking routine word problems. See the Scope & Sequence on page T21 for a complete list of problem-solving objectives for this grade level.

*Houghton Mifflin Mathematics* deals with problem solving in six different ways.

### 1. Lesson Introductions.

Every possible lesson is introduced with a word problem. This puts the mathematical concept in a real-world context and also gives the student experience with the key words and phrases that may be used in problems associated with the mathematical objective.

### 2. Practice Section.

Every possible lesson includes more problems in the *Practice* section. The students are given experience with the different ways similar types of problems can be phrased. Thus, they should then be better able to recognize problems by type when they encounter them in sets of mixed problems.

### 3. Problem Solving Lessons.

Almost every unit has at least one full lesson on problem solving. These lessons teach the basic four-step strategy for routine word problems and also other strategies for attacking many types of problems.

### 4. Something Extra.

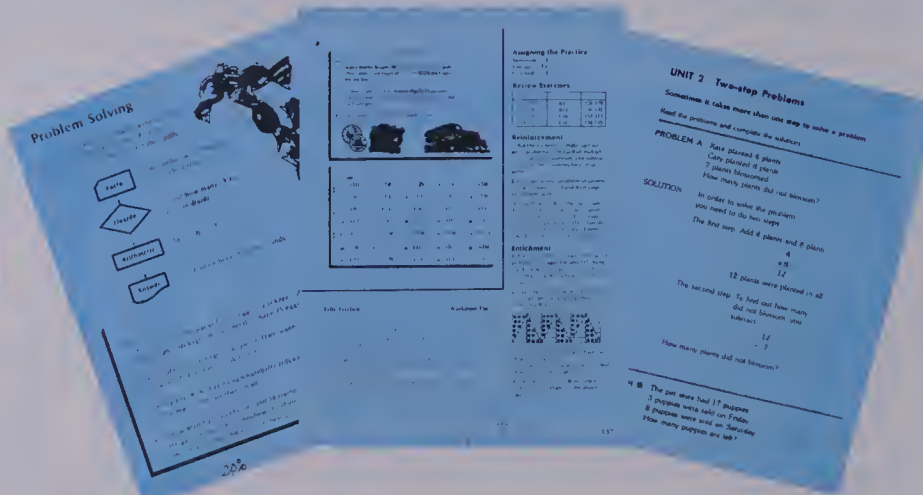
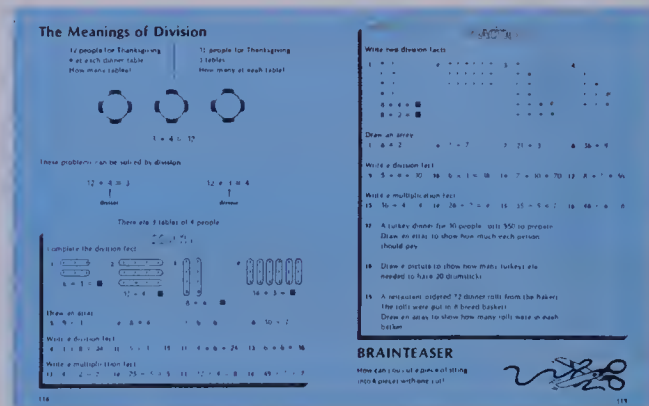
The section in the textbook at the bottom right of every lesson provides more challenging non-routine problems for enrichment.

### 5. Teacher's Resource Book and Practice Masters.

The Teacher's Resource Book provides extra material for all levels of ability. The Extra Practice sections provide more problems for the average student. These are available separately on Houghton Mifflin's *Testing and Practice Masters*. The *Reinforcement* sections provide ideas for alternative types of practice and for re-teaching for students of lower ability. The *Enrichment* section provides challenges for better students, and also give ideas for open-ended (divergent) mathematical investigations.

### 6. Problem Solving Activities.

Every grade level has a separate booklet of problem solving activities, correlated to the lessons in the textbook. These booklets provide ample opportunity for students to extend their problem solving abilities even further.



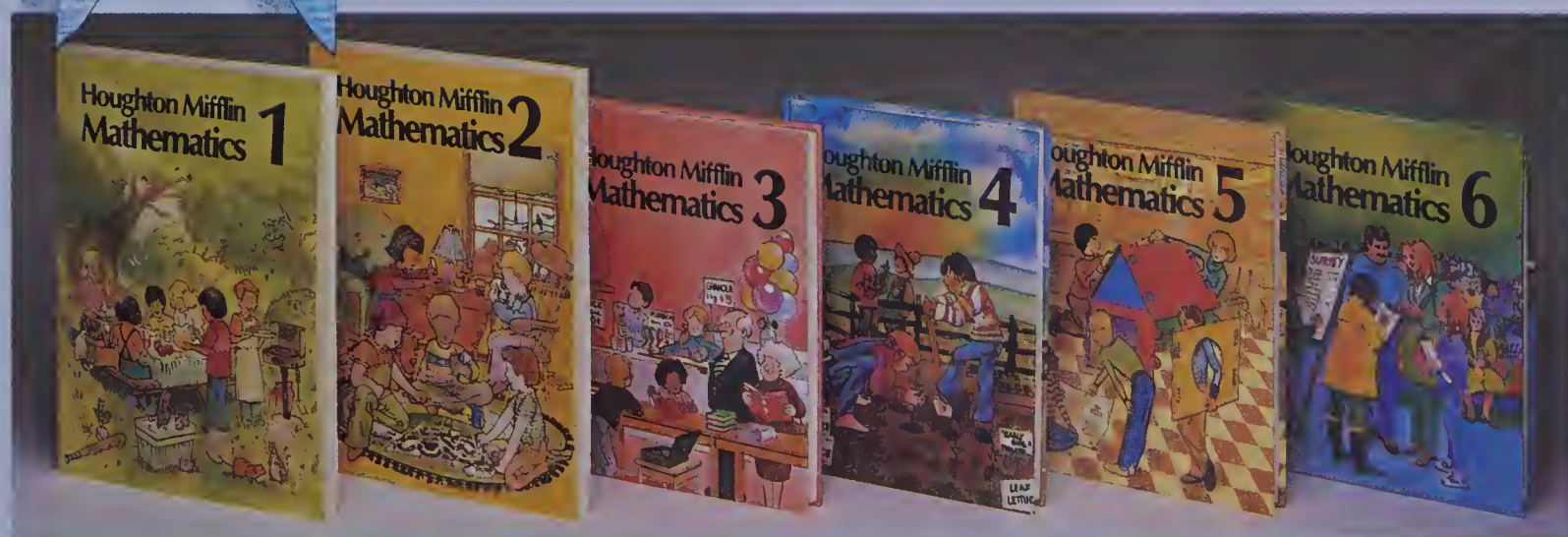


# Mathematics for the 80's

Are these your priorities?

**P**roblem Solving  
**R**eal-World Applications  
**I**n-Depth Developmental Lessons  
**O**ne Strand Block Units  
**R**eady-to-Use Teacher's Resource Books  
**I**ndividualized Learning Materials  
**T**esting and Management Programs  
**Y**ear-Round Motivational Features

...Then here is your program!



## Houghton Mifflin Mathematics

# The Student Text and Teacher Resource Book

Student Objectives coded for easy tracking and reviewing.

Functional, full colour illustrations.

Introductory activity emphasizing prerequisite skills, using concrete experiences.

Textbook develops skills from problem solving, real world situations.

Lesson plan involving both concrete materials and textbook pages using pictorial representation (semi-concrete).

Developmental Exercises to work with the students to assure that the objective is mastered.

Teacher's Resource Book page number corresponds to pupil's textbook.

The **Teacher's Resource Book** provides black-and-white reproductions of the textbook pages with full answers and annotations.

## UNIT 3 LESSON 2

### Objective A10

Add two- and three-digit numbers, regroup tens.

### Introducing the Lesson

Show the students the following models and ask them about the regrouping that should be done.



2 flats, 12 rods, 4 cubes

The students should decide that the 12 rods can be regrouped as 1 flat and 2 rods.



3 flats, 2 rods, 4 cubes

Summarize the modelling with these place-value charts:

100s	10s	1s		100s	10s	1s
2	12	4	=	3	2	4

Try several other similar examples.

### Teaching the Lesson

Discuss the bowling problem at the top of page 48. Model the required addition with place-value number blocks. Point out that it is easiest to add cubes first.



"Adding cubes, there are 6. Add the rods. Since there are 12 rods, regroup them as 1 flat and 2 rods. Then add."



3 flats, 2 rods, 6 cubes  
or, 3 hundreds, 2 tens, 6 ones  
or,  $300 + 20 + 6$   
or, 326

Have the students practise modelling and recording several other similar addition examples. Use problems with three addends as well.

48

## Regrouping Tens

MY SCORES ARE 175 AND 151. WHAT'S MY TOTAL?



Write the question

$$\begin{array}{r} 175 \\ + 151 \\ \hline \end{array}$$

Add ones

$$\begin{array}{r} 175 \\ + 151 \\ \hline 6 \end{array}$$

Add tens

$$\begin{array}{r} 175 \\ + 151 \\ \hline 126 \end{array}$$

12 tens is 1 hundred and 2 tens  
Regroup

$$\begin{array}{r} 175 \\ + 151 \\ \hline 26 \end{array}$$

Add hundreds

$$\begin{array}{r} 175 \\ + 151 \\ \hline 326 \end{array}$$

$$\begin{array}{r} 175 \\ + 151 \\ \hline 326 \end{array}$$

The total score for the 2 games is 326

EXERCISES				
Add				
1. $\begin{array}{r} 47 \\ + 60 \\ \hline 107 \end{array}$	2. $\begin{array}{r} 52 \\ + 64 \\ \hline 116 \end{array}$	3. $\begin{array}{r} 65 \\ + 83 \\ \hline 148 \end{array}$	4. $\begin{array}{r} 90 \\ + 33 \\ \hline 123 \end{array}$	5. $\begin{array}{r} 81 \\ + 84 \\ \hline 165 \end{array}$
6. $\begin{array}{r} 347 \\ + 60 \\ \hline 407 \end{array}$	7. $\begin{array}{r} 152 \\ + 64 \\ \hline 216 \end{array}$	8. $\begin{array}{r} 565 \\ + 83 \\ \hline 648 \end{array}$	9. $\begin{array}{r} 290 \\ + 33 \\ \hline 323 \end{array}$	10. $\begin{array}{r} 381 \\ + 84 \\ \hline 465 \end{array}$
11. $\begin{array}{r} 274 \\ + 382 \\ \hline 656 \end{array}$	12. $\begin{array}{r} 490 \\ + 255 \\ \hline 745 \end{array}$	13. $\begin{array}{r} 528 \\ + 191 \\ \hline 719 \end{array}$	14. $\begin{array}{r} 742 \\ + 170 \\ \hline 912 \end{array}$	15. $\begin{array}{r} 382 \\ + 382 \\ \hline 764 \end{array}$
16. $\begin{array}{r} 451 \\ + 450 \\ \hline 901 \end{array}$	17. $\begin{array}{r} 163 \\ + 466 \\ \hline 629 \end{array}$	18. $\begin{array}{r} 283 \\ + 571 \\ \hline 854 \end{array}$	19. $\begin{array}{r} 394 \\ + 482 \\ \hline 876 \end{array}$	20. $\begin{array}{r} 671 \\ + 291 \\ \hline 962 \end{array}$

48

### Using the Exercises

- Questions 1 to 5 are paired with Questions 6 to 10 to provide practice first with regrouping tens with two-digit addends and then with regrouping tens with a three- and a two-digit addend.
- Questions 11 to 20 provide examples with three-digit addends requiring the regrouping of tens.

Description of developmental exercises aids in teaching the skill and diagnosing problems.



# provide a complete learning and teaching package.

## PRACTICE

Find the sum

- |   |   |  |   |   |
|---|---|--|---|---|
| 1. $\begin{array}{r} 52 \\ + 67 \\ \hline 119 \end{array}$    | 2. $\begin{array}{r} 78 \\ + 91 \\ \hline 169 \end{array}$    | 3. $\begin{array}{r} 43 \\ + 92 \\ \hline 135 \end{array}$   | 4. $\begin{array}{r} 60 \\ + 84 \\ \hline 144 \end{array}$    | 5. $\begin{array}{r} 35 \\ + 83 \\ \hline 118 \end{array}$    |
| 6. $\begin{array}{r} 161 \\ + 263 \\ \hline 424 \end{array}$  | 7. $\begin{array}{r} 472 \\ + 180 \\ \hline 652 \end{array}$  | 8. $\begin{array}{r} 553 \\ + 283 \\ \hline 836 \end{array}$ | 9. $\begin{array}{r} 661 \\ + 174 \\ \hline 835 \end{array}$  | 10. $\begin{array}{r} 391 \\ + 267 \\ \hline 658 \end{array}$ |
| 11. $\begin{array}{r} 274 \\ + 274 \\ \hline 548 \end{array}$ | 12. $\begin{array}{r} 451 \\ + 478 \\ \hline 929 \end{array}$ | 13. $\begin{array}{r} 584 \\ + 95 \\ \hline 679 \end{array}$ | 14. $\begin{array}{r} 293 \\ + 102 \\ \hline 486 \end{array}$ | 15. $\begin{array}{r} 341 \\ + 245 \\ \hline 586 \end{array}$ |

Solve

16. During a bowling tournament, Sam scored 180 and 178 for his first two games. What was Sam's total score for these two games? **358**
17. Joanne was practising for a bowling tournament and scored 189 and 191 on two games. What was her total score for the two games? **380**

## Special Addition

Each addition question below uses all of the digits from 1 to 9. Each digit is used just once.



Make up other addition questions like the ones above.

Answers may vary

49

## Assigning the Practice

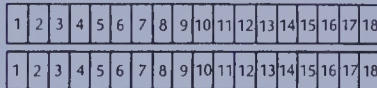
Minimum: 1-10

Average: 1-17

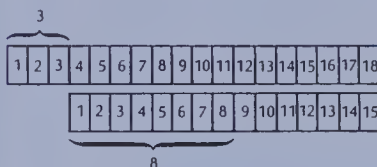
Enriched: 6-17

## Reinforcement

Students can make "adding machines" according to the following directions: Cut out two centimetre square strips. There should be at least 18 squares on each strip. Number the squares from left to right.



To add, for example,  $3 + 8$ , move the bottom strip so its left end is at the edge of the '3' square of the top strip. Then find the '8' on the bottom strip. The sum of 3 and 8 is above the '8' on the bottom strip.



## Enrichment

1. The *Special Addition* challenge, page 49, will have to be solved by a method of trial and error. It provides addition practice, but may be frustrating for all but the highly motivated students.

2. Ask the students to find a true statement about each:  
a. the sum of two even numbers;  
b. the sum of two odd numbers; and  
c. the sum of an even number and an odd number.

## Problem Solving Activities

Assign Level 4, page 6.

Assignments for students of 3 levels of ability.

Practice exercises for skill mastery.

Reinforcement provides alternative types of practice and ideas for reteaching.

Word problems in every possible lesson.

Enrichment in both textbook and Teacher's Resource Book to keep the gifted child involved.

Extra Practice Masters (available separately) are reproduced here for every lesson.

Extra Problem Solving Activities (available separately) for each unit.

49

## Extra Practice

## Worksheet A10

Pages 48-49

Rewrite the number as hundreds and tens

1. 11 tens = 1 hundred + 1 ten      2. 46 tens = 4 hundreds + 6 tens  
3. 30 tens = 3 hundreds + 0 tens      4. 18 tens = 1 hundred + 8 tens

Add

- |   |   |  |   |   |
|---|---|--|---|---|
| 5. $\begin{array}{r} 343 \\ + 182 \\ \hline 525 \end{array}$  | 6. $\begin{array}{r} 256 \\ + 71 \\ \hline 327 \end{array}$   | 7. $\begin{array}{r} 480 \\ + 390 \\ \hline 870 \end{array}$ | 8. $\begin{array}{r} 544 \\ + 95 \\ \hline 639 \end{array}$   | 9. $\begin{array}{r} 347 \\ + 261 \\ \hline 608 \end{array}$  |
| 10. $\begin{array}{r} 182 \\ + 777 \\ \hline 959 \end{array}$ | 11. $\begin{array}{r} 396 \\ + 112 \\ \hline 508 \end{array}$ | 12. $\begin{array}{r} 68 \\ + 341 \\ \hline 409 \end{array}$ | 13. $\begin{array}{r} 290 \\ + 675 \\ \hline 965 \end{array}$ | 14. $\begin{array}{r} 328 \\ + 280 \\ \hline 608 \end{array}$ |

Houghton Mifflin Mathematics was developed by an experienced team of educators and consultants from across Canada.

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Consultants: Gary Hatcher, Bill Hoppins, Judy Threadgill, George Williams, Peggy Williamson

# Houghton Mifflin Mathematics

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## PROBLEM SOLVING

- ☐ Sequenced lessons teach problem solving strategies.
- ☐ The unique IDEA strategy keeps your pupils on track.
- ☐ Problem solving questions in every lesson maintain performance.

## REAL-WORLD APPLICATIONS

- ☐ Every unit is developed through a real-world theme.
- ☐ Lessons are introduced by a real-world problem.
- ☐ Exercises include real-world applications.

## IN-DEPTH DEVELOPMENTAL LESSONS

- ☐ Each lesson is devoted to a single objective.
- ☐ Skills are based upon understanding, using concrete materials.
- ☐ Developmental exercises make objectives easy to learn.

## ONE STRAND BLOCK UNITS

- ☐ Each unit is devoted to the development of one strand.
- ☐ Each unit provides thorough practice for objectives.
- ☐ Each unit reviews, tests, and reinforces objectives.

## READY-TO-USE TEACHER'S RESOURCE BOOKS

- ☐ The Resource Book contains detailed lesson plans.
- ☐ The Resource Book provides both reinforcement and enrichment activities.
- ☐ The Resource Book has complete answers to exercises and practice.

## INDIVIDUALIZED LEARNING MATERIALS

- ☐ Every unit provides Pre-tests and Post-tests for readiness and assessment.
- ☐ Every unit has provisions for remediation and enrichment.
- ☐ Every unit has built-in reviews and cumulative reviews

## TESTING AND MANAGEMENT PROGRAMS

- ☐ The textbook has unit tests and cumulative tests.
- ☐ The Resource Book contains extra practice and evaluation material.
- ☐ The Resource Book uses coded objectives to establish a diagnostic system.

## YEAR-ROUND MOTIVATIONAL FEATURES

- ☐ Every lesson has functional and appealing artwork.
- ☐ Every lesson has a challenging "Something Extra" including calculator activities and computer literacy.
- ☐ Every unit has an interesting child-oriented theme.

### Book 1

1-98001 Pupil's Workbook  
1-98011 Teacher's Resource Book  
1-98021 Testing and Practice Masters  
1-98031 Problem Solving Activities

### Book 2

1-98002 Pupil's Workbook  
1-98012 Teacher's Resource Book  
1-98022 Testing and Practice Masters  
1-98032 Problem Solving Activities

### Book 3

1-98003 Pupil's Textbook  
1-98013 Teacher's Resource Book  
1-98023 Testing and Practice Masters  
1-98033 Problem Solving Activities

### Book 4

1-98004 Pupil's Textbook  
1-98014 Teacher's Resource Book  
1-98024 Testing and Practice Masters  
1-98034 Problem Solving Activities

### Book 5

1-98005 Pupil's Textbook  
1-98015 Teacher's Resource Book  
1-98025 Testing and Practice Masters  
1-98035 Problem Solving Activities

### Book 6

1-98006 Pupil's Textbook  
1-98016 Teacher's Resource Book  
1-98026 Testing and Practice Masters  
1-98036 Problem Solving Activities

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# Learning Objectives

The following objectives are covered in depth in *Houghton Mifflin Mathematics 4*.

## Numeration

		Lesson	Pages
N1	Compare two-digit numbers using $<$ , $=$ , or $>$ .	1-1	2-3
N2	Extend the numeration system to hundreds.	1-2	4-5
N3	Extend the numeration system to thousands.	1-3	6-7
N4	Extend the numeration system to hundred thousands.	1-5	10-11
N5	Round to the nearest ten, hundred, or thousand.	1-6	12-13
N6	Read and write ordinal numbers.	1-7	14-15
N7	Read and write Roman numerals I to C.	1-8	16-17
N8	Write a fraction for the shaded part of a whole.	7-1	142-143
N9	Use a picture to write fraction equivalents.	7-2	144-145
N10	Compare fractions having the same denominator.	7-3	146-147
N11	Write a fraction for part of a set of objects.	7-4	148-149
N12	Write tenths using fraction and decimal notation.	7-5	150-151
N13	Write decimals equal to or greater than one.	7-6	152-153
N14	Extend the numeration system to hundredths	14-1	310-311
N15	Write and compare decimals greater than one.	14-2	312-313
N16	Regroup tenths and hundredths.	14-3	314-315

## Arithmetic

		Lesson	Pages
A1	Recall addition and subtraction facts to 13.	2-1	22-23
A2	Recall addition and subtraction facts to 18.	2-2	24-25
A3	Add two-digit numbers without regrouping.	2-3	26-27
A4	Add a two-digit and a one-digit number with regrouping.	2-4	28-29
A5	Add three addends.	2-5	30-31
A6	Subtract two-digit numbers without regrouping.	2-6	32-33
A7	Subtract a one-digit number from a two-digit number with regrouping.	2-7	34-35
A8	Add and subtract three-digit numbers with regrouping.	2-8	36-37
A9	Add two- and three-digit numbers, regroup ones.	3-1	46-47
A10	Add two- and three-digit numbers, regroup tens.	3-2	48-49
A11	Add two- and three-digit numbers, regroup ones and tens.	3-3	50-51
A12	Add three- and four-digit numbers, regroup ones, tens, and hundreds.	3-4	52-53
A13	Subtract two-digit numbers, regroup tens.	3-5	54-55
A14	Subtract three-digit numbers, regroup tens.	3-6	56-57
A15	Subtract three-digit numbers, regroup tens and hundreds.	3-7	58-59
A16	Subtract four-digit numbers, regroup tens, hundreds, and thousands.	3-8	60-61
A17	Round to estimate sums and differences with numbers of up to four digits.	3-9	62-63
A18	Use arrays, repeated addition, and commutativity to develop multiplication facts.	5-1	94-95
A19	Use 2 and 3 as factors in multiplication.	5-2	96-97
A20	Use 4 and 5 as factors in multiplication.	5-3	98-99
A21	Use 0 and 1 as factors in multiplication.	5-4	100-101
A22	Use 0 to 5 as factors in multiplication.	5-5	102-103
A23	Use 6 and 7 as factors in multiplication.	5-6	104-105
A24	Use 8 and 9 as factors in multiplication.	5-7	106-107
A25	Use 10 as a factor in multiplication.	5-8	108-109
A26	Use 0 to 10 as factors in multiplication.	5-9	110-111
A27	Use related multiplication facts and arrays to develop division facts.	6-1	118-119
A28	Use 2 and 3 as divisors.	6-2	120-121
A29	Use 4 and 5 as divisors.	6-3	122-123
A30	Use 1 as a divisor and 0 as a dividend.	6-4	124-125
A31	Use the multiplication table to divide.	6-5	126-127
A32	Use 6 and 7 as divisors.	6-6	128-129
A33	Use 8 and 9 as divisors.	6-7	130-131
A34	Use 10 as a divisor.	6-8	132-133
A35	Use 1 to 10 as divisors.	6-9	134-135



		<b>Lesson</b>	<b>Pages</b>
A36	Add tenths.	7-8	156-157
A37	Subtract tenths.	7-9	158-159
A38	Multiply a multiple of 10 by a one-digit number.	8-1	166-167
A39	Multiply the sum of two numbers by a one-digit number (distributive property).	8-2	168-169
A40	Multiply a two-digit number by a one-digit number, with no regrouping.	8-3	170-171
A41	Multiply a two-digit number by a one-digit number, with regrouping of ones.	8-4	172-173
A42	Multiply a multiple of 100 by a one-digit number; estimate products using multiples of 10 or 100.	8-5	174-175
A43	Multiply a three-digit number by a one-digit number, with regrouping of ones.	8-6	176-177
A44	Multiply a three-digit number by a one-digit number, with regrouping of ones and tens.	8-7	178-179
A45	Multiply three factors (associative property).	8-8	180-181
A46	Divide a two-digit dividend by a one-digit divisor with a one-digit quotient and no remainder.	9-1	190-191
A47	Divide a two-digit dividend by a one-digit divisor with a one-digit quotient and a remainder.	9-2	192-193
A48	Divide a multiple of 10 by a one-digit divisor with no remainder.	9-3	194-195
A49	Divide a two-digit dividend by a one-digit divisor where each digit of the dividend is a multiple of the divisor (no remainder).	9-4	196-197
A50	Divide a two-digit dividend by a one-digit divisor where the first digit of the dividend is not a multiple of the divisor (no remainder).	9-5	198-199
A51	Divide a two-digit dividend by a one-digit divisor with a two-digit quotient and a remainder.	9-6	200-201
A52	Divide a three-digit dividend by a one-digit divisor with a two-digit quotient where the first two digits of the dividend are a multiple of the divisor (no remainder).	9-7	202-203
A53	Divide a three-digit dividend by a one-digit divisor with a two-digit quotient where the first two digits of the dividend are not a multiple of the divisor (no remainder).	9-8	204-205
A54	Divide a three-digit dividend by a one-digit divisor with a two-digit quotient and a remainder.	9-9	206-207
A55	Find the average of a group of numbers.	10-5	222-223
A56	Interpret ratios.	10-6	224-225
A57	Multiply a two-digit number by a two-digit multiple of 10.	11-1	238-239
A58	Multiply two two-digit numbers.	11-2	240-241
A59	Multiply a three-digit number by a two-digit multiple of 10.	11-3	242-243
A60	Multiply a three-digit number by a two-digit number.	11-4	244-245
A61	Divide a three-digit dividend by a one-digit divisor with no remainder. (Each digit of the dividend is a multiple of the divisor.)	11-5	246-247
A62	Divide a three-digit dividend by a one-digit divisor with no remainder. (The second digit of the dividend is not a multiple of the divisor.)	11-6	248-249
A63	Divide a three-digit dividend by a one-digit divisor with no remainder. (The first two digits of the dividend are not multiples of the divisor.)	11-7	250-251
A64	Divide a three-digit number by a one-digit divisor with a remainder.	11-8	252-253
A65	Divide a three-digit dividend by a one-digit divisor when there is a zero in the quotient.	11-9	254-255
A66	Add hundredths.	14-4	316-317
A67	Subtract hundredths.	14-5	318-319
A68	Add and subtract fractions with the same denominator.	14-8	324-325
A69	Change fractions to decimals.	14-9	326-327

## Geometry

		<b>Lesson</b>	<b>Pages</b>
G1	Recognize and analyse cubes, cones, spheres, cylinders, and pyramids.	12-1	262-263
G2	Recognize and compare angles.	12-2	264-265
G3	Recognize and name parallel, intersecting, and perpendicular lines.	12-3	266-267
G4	Recognize rectangles and squares and congruent rectangles.	12-4	268-269
G5	Recognize and classify triangles.	12-5	270-271
G6	Sort and classify plane figures.	12-6	272-273
G7	Recognize and demonstrate slides.	12-7	274-275
G8	Recognize and demonstrate flips.	12-8	276-277
G9	Recognize and investigate the circumference and centre of a circle.	12-9	278-279
G10	Recognize and demonstrate turns.	12-10	280-281

## Measurement

		Lesson	Pages
<b>M1</b>	Write amounts of money using the dollar sign, relate dollars, dimes, and cents to place value, and compare prices.	1-4	8-9
<b>M2</b>	Measure temperature in degrees Celsius.	2-10	40-41
<b>M3</b>	Recognize and use the millimetre as a unit of length.	4-1	70-71
<b>M4</b>	Recognize and use the kilometre as a unit of length.	4-2	72-73
<b>M5</b>	Use appropriate units for length estimation and measurement.	4-3	74-75
<b>M6</b>	Understand and apply the concept of perimeter.	4-4	76-77
<b>M7</b>	Recognize and use the gram and kilogram as units of mass.	4-5	78-79
<b>M8</b>	Convert cents to dollars and dollars to cents.	4-6	80-81
<b>M9</b>	Add and subtract money up to \$99.99.	4-7	82-83
<b>M10</b>	Use the additive method to make change up to \$10.00.	4-9	86-87
<b>M11</b>	Recognize and use the millilitre as a unit of capacity.	4-10	88-89
<b>M12</b>	Measure length in decimetres; relate decimetres to centimetres and to metres.	7-7	154-155
<b>M13</b>	Use estimation in measurement problems.	8-10	184-185
<b>M14</b>	Find area by counting squares or multiplying.	10-1	214-215
<b>M15</b>	Find area in square centimetres and square metres.	10-2	216-217
<b>M16</b>	Find volume by counting cubes or multiplying.	10-3	218-219
<b>M17</b>	Find volume in cubic centimetres and cubic metres.	10-4	220-221
<b>M18</b>	Read and interpret a map drawn to scale.	10-7	226-227
<b>M19</b>	Recognize and use the time units years, months, weeks, days, hours, minutes, and seconds.	10-8	228-229
<b>M20</b>	Tell time to the minute on the 24 hour clock.	10-9	230-231
<b>M21</b>	Express linear measure to the nearest tenth and hundredth.	14-7	322-323

## Graphing

		Lesson	Pages
<b>GR1</b>	Read and make pictographs (1:1, 2:1).	13-2	288-289
<b>GR2</b>	Read and make pictographs (5:1, 10:1, 50:1, 100:1).	13-3	290-291
<b>GR3</b>	Read and make bar graphs (1:1, 2:1, 5:1).	13-4	292-293
<b>GR4</b>	Read and make bar graphs (10:1, 50:1, 100:1, 500:1).	13-5	294-295
<b>GR5</b>	Read and make point graphs.	13-6	296-297
<b>GR6</b>	Identify locations (cells) on grids by using ordered pairs.	13-7	298-299
<b>GR7</b>	Write an ordered pair for a point on a coordinate grid.	13-8	300-301
<b>GR8</b>	Record a slide on a coordinate grid.	13-9	302-303

## Problem Solving

		Lesson	Pages
<b>PS1</b>	Read and interpret statistical charts and tables.	1-9	18
<b>PS2</b>	Recognize words and phrases associated with addition and subtraction problems.	2-9	38-39
<b>PS3</b>	Use a problem solving strategy.	3-10	64-65
<b>PS4</b>	Solve simple measurement problems involving length, mass, and money.	4-8	84-85
<b>PS5</b>	Solve simple multiplication problems.	5-10	112-113
<b>PS6</b>	Solve word problems involving division.	6-10	136-137
<b>PS7</b>	Solve problems involving the addition and subtraction of decimals.	7-10	160-161
<b>PS8</b>	Solve problems with multiplication or division.	8-9	182-183
<b>PS9</b>	Identify the correct operation in a problem-solving situation.	9-10	208-209
<b>PS10</b>	Recognize problems involving insufficient information.	10-10	232-233
<b>PS11</b>	Solve problems involving extraneous information.	11-10	256-257
<b>PS12</b>	Read and interpret charts and tables.	13-1	286-287
<b>PS13</b>	Use or make a diagram to solve a problem.	13-10	304-305
<b>PS14</b>	Solve problems involving decimals.	14-6	320-321

# Student Record Chart

for Pretests, Book Tests, and Post-tests

## Numeration

N1	<div></div>
N2	<div></div>
N3	<div></div>
N4	<div></div>
N5	<div></div>
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N11	<div></div>
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N13	<div></div>
N14	<div></div>
N15	<div></div>
N16	<div></div>

A26	<div></div>
A27	<div></div>
A28	<div></div>
A29	<div></div>
A30	<div></div>
A31*	<div></div>
A32	<div></div>
A33	<div></div>
A34	<div></div>
A35*	<div></div>
A36	<div></div>
A37	<div></div>
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A40	<div></div>
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A42†	<div></div>
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A67	<div></div>
A68†	<div></div>
A69	<div></div>

## Arithmetic

A1	<div></div>
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## Measurement

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## Geometry

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G8	<div></div>
G9	<div></div>
G10	<div></div>

## Graphing

GR1	<div></div>
GR2	<div></div>
GR3	<div></div>
GR4	<div></div>
GR5	<div></div>
GR6	<div></div>
GR7	<div></div>
GR8	<div></div>

\*Three questions per box.  
†Two questions per box.



# Scope & Sequence

3

4

5

## NUMERATION

Two-digit numerals/2-3, 41  
Three-digit numerals/42-58  
Decimal notation/262-265, 272-275  
Compare using  $<$  and  $>$ /48-49, 266-267  
Read and write amounts of money/52-53, 276-277  
Ordinal numbers/32-33  
Round to the nearest 10 and 100/172-173  
Roman numerals/288-289  
Four-digit numerals/56-57  
Numeration and the metric system/28-29, 50-51, 68-69, 274-275  
Fractions/252-257, 261  
Extra Practice/299, 301, 302-307

Two-digit numerals/1-3  
Three-digit numerals/4-5  
Four-digit numerals/6-7  
Six-digit numerals/10-11  
Decimal notation/150-153, 310-315  
Comparing/2-11, 146-147, 153  
Money/8-9, 80-81  
Ordinal numbers/14-15  
Rounding/12-13, 62-63, 81  
Roman numerals/16-17  
Fractions/142-145, 148-149  
Extra Practice/330, 333

Three-digit numerals/1  
Six-digit numerals/2-3  
Nine-digit numerals/4-5  
Decimal notation/10-15, 242-245  
Comparing/6-7, 16-19, 22, 162-163, 242-243  
Rounding/8-9, 20-21  
Roman numerals/306-307  
Fractions/145-147, 158-163, 313, 318-319  
Ratio/152-157  
Percent/256-259  
Extra Practice/332, 335

## MEASUREMENT

Time/110-118  
Length/6-7, 14-15, 28-29, 50-51, 68-69, 76-77, 101, 107, 274-275  
centimetre/6-7  
decimetre/28-29  
metre/50-51  
kilometre/68-69  
Perimeter/14-15, 76-77  
Area/234-238  
square centimetre/234-237  
Volume/282-286  
cubic centimetre/284-285  
Capacity/268-269  
litre/268-269  
millilitre/269  
Mass/102-105  
kilogram/102-105  
gram/102-105  
Temperature/108-109  
Measuring instruments/105, 286  
Money/2-3, 24, 41, 52-54, 122, 168-169, 171, 176-177, 192-193, 276-277  
Extra Practice/79, 99, 139, 239, 301, 302, 304-305, 307

Time/228-231  
seconds/228  
24 hour clock/230-231  
Length/69-77, 154-155, 184-185, 222, 226-227, 296, 322-323  
millimetre/70-71  
kilometre/72-73  
decimetre/154-155  
Perimeter/176-177  
Area/214-217  
square centimetre/216-217  
square metre/216-217  
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# UNIT 1

## Numerals to 999 999

Theme: Construction

Lesson		Objective	Pages
Preview		Recall two-digit numerals.	1
1	N1	Compare two-digit numbers using $<$ , $=$ , or $>$ .	2-3
2	N2	Extend the numeration system to hundreds.	4-5
3	N3	Extend the numeration system to thousands.	6-7
4	M1	Write amounts of money using the dollar sign, relate dollars, dimes, and cents to place value, and compare prices.	8-9
5	N4	Extend the numeration system to hundred thousands.	10-11
6	N5	Round to the nearest ten, hundred, or thousand.	12-13
7	N6	Read and write ordinal numbers.	14-15
8	N7	Read and write Roman numerals I to C.	16-17
9	PS1	Read and interpret statistical charts and tables.	18
Test		Numerals to 999 999	19

### About This Unit

The aim of this unit is:

1. to develop skills in recognizing place value with whole numbers up to hundred thousands;
2. to develop skills in rounding numbers to the nearest ten and nearest hundred;
3. to develop skills in reading and writing ordinal numbers and Roman numerals.

Students will have studied numeration to 1000 in the previous grade and this unit assumes mastery of at least two-digit numerals for counting, skip-counting, place value, and betweenness. Page 1 provides review exercises to test the student's mastery of earlier work.

The lessons on place value and rounding are arranged in a developmental sequence and should be studied in that order for maximum benefit. The newly acquired knowledge of place value is applied to money situations. Roman numerals introduce children to part of the history of numeration. Roman numerals also help the

children to see the need for a numeration system which uses place value. The lessons on ordinal numbers and Roman numerals build on skills learned in earlier grades.

The teaching strategy is to develop the numeration system, step by step, from tens to hundred thousands. Each lesson builds on skills that have been developed in previous lessons. An attempt is made to introduce each with a concrete situation and then to extend it to more abstract concepts. It is suggested that concrete materials such as abacuses, place-value pockets, place-value blocks, or sticks be used to introduce the lessons and, if necessary, for remedial help.

Throughout this book, the words *number* and *numeral* are used properly where the distinction is clear. A *numeral* is a written symbol for a *number*. The word *number* is used when the distinction is vague. For example, in comparing numbers, the process involves examining the digits of the numerals. However, as a comparison of



quantities is involved, we still speak of “comparison of 2-digit numbers.” It is wise *not* to make too much of this distinction with the students, but to use the words properly whenever the distinction is clear.

## Ideas

1. Make a set of 20 playing cards with two cards each of the numerals 0 to 9. Each player or team must have a place-value chart on which to play. The object of the game is to make the largest number. Shuffle the cards and place them face down. The first player draws a card and places it on his or her place-value chart. (The player may decide to discard it, but only one discard per game is allowed.) Then, the next person picks a card and places it on his or her place-value chart. Once cards have been placed, they cannot be moved. Play continues until everyone has made a 3-digit number. The person with the largest number wins.

hundreds	tens	ones
6	4	3

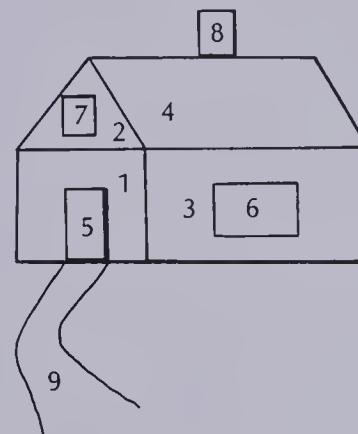
The game can be played again, with the players trying to make the smallest number. Have the students research the ages of neighbourhood buildings. Display the information on a bulletin board. Ages can be written in standard form, expanded form, and words.

2. Make a worksheet by writing four or more numbers in words for each question. Ask the students to write the numbers beside the words and then to find the sum of the numbers using a calculator. The sum will indicate whether or not the student can read and write the numbers correctly.

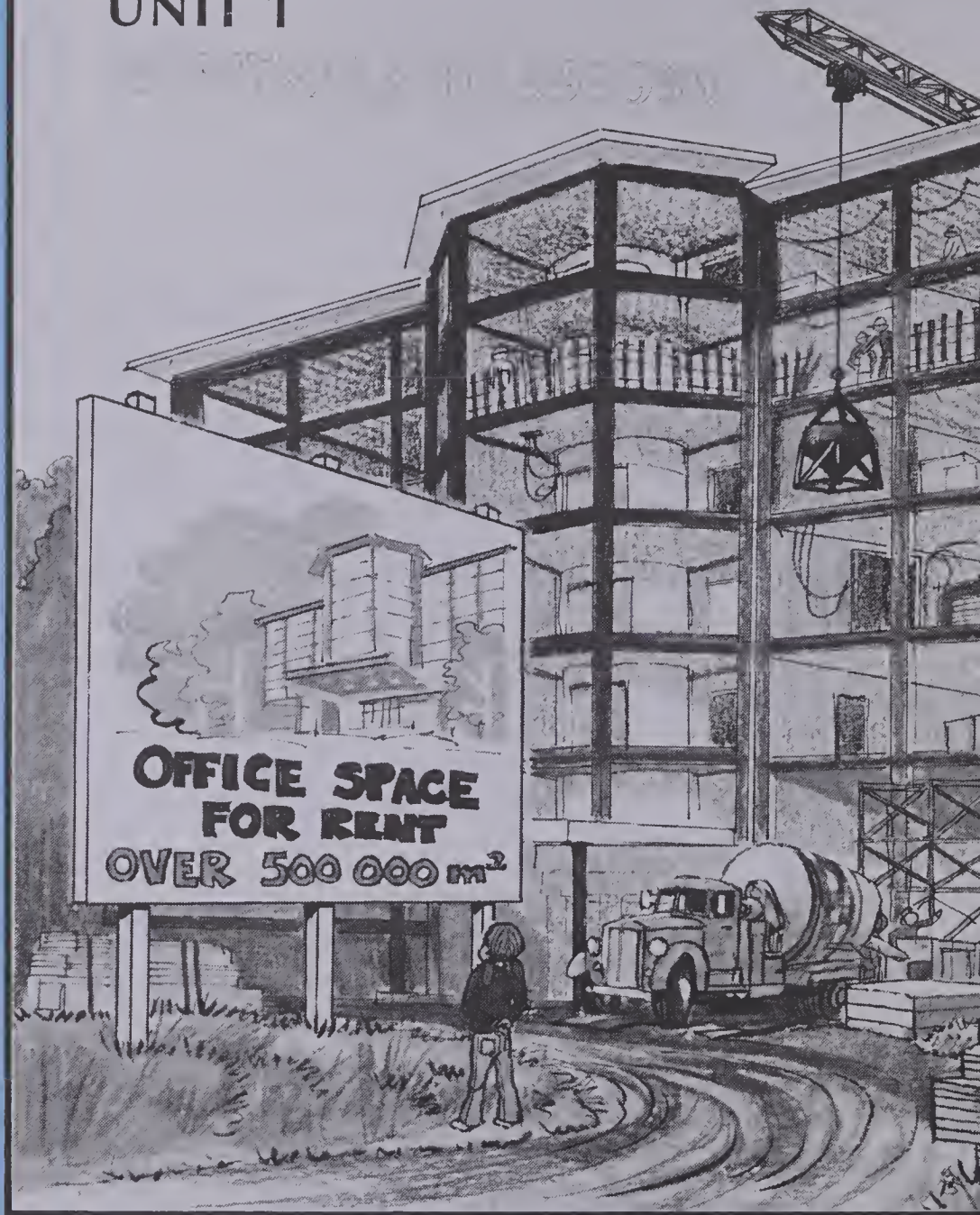
Example:

one hundred two	102
twenty-eight	28
one thousand seven	1007
sixty-four	64
	<hr/> 1201

3. Since the theme of this unit is construction, build a house on the bulletin board using construction paper. At the completion of each lesson, put up a part of the house with suitable labels or pictures to identify what concepts have been covered in that lesson. Students can take turns making the various parts of the house.



# UNIT 1



Unit 1 Objectives	Test Questions	Pages
N1	1-3	2-3
N2	4-6, 13, 14	4-5
N3	7-9, 15, 16	6-7
M1	10-12, 17, 18	8-9
N4	19-22	10-11
N5	23-26	12-13
N6	27-31	14-15
N7	32-36	16-17

## Pretest

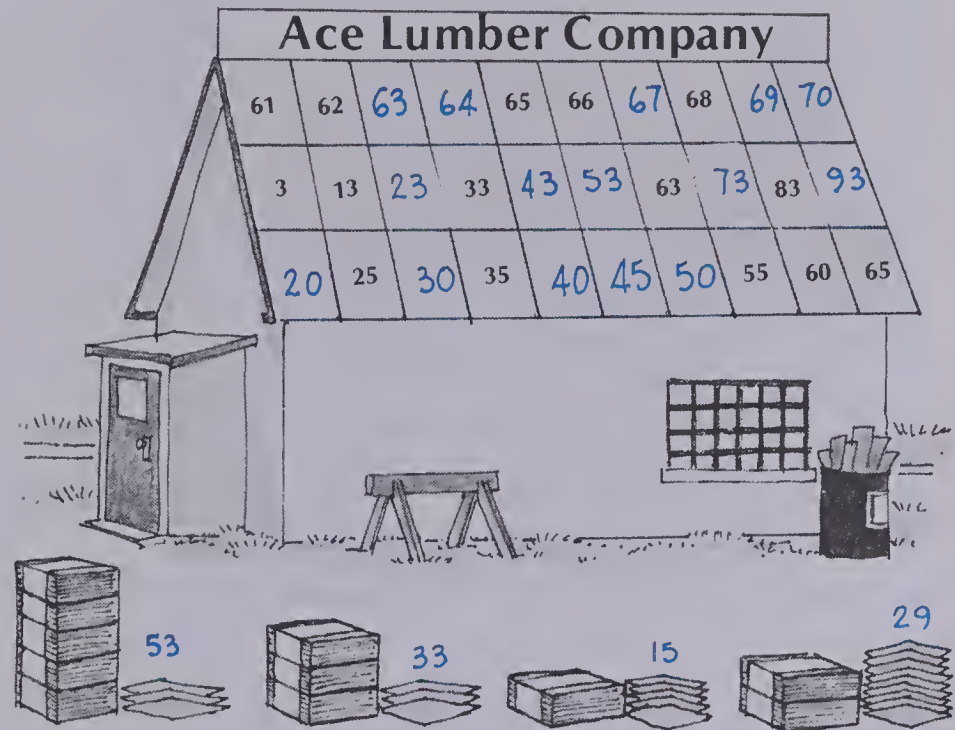
## Unit 1

Complete.

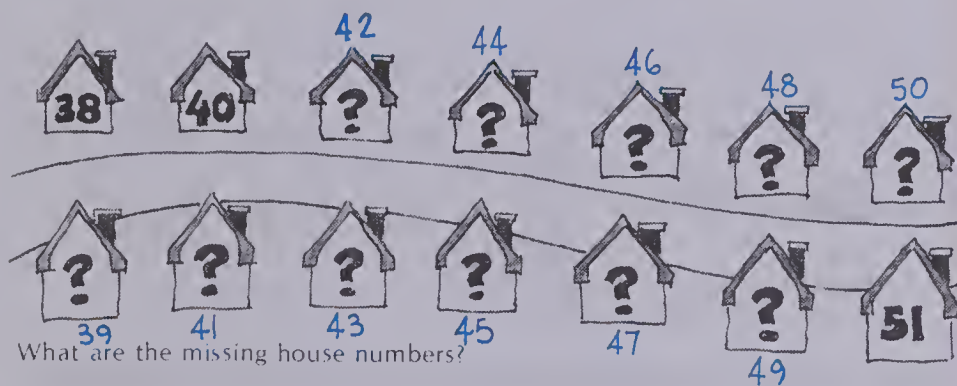
- $67 < 76$
- $49 < 81$
- $63 < 65$
- $127 < 271$
- $184 > 148$
- $209 > 92$
- $7531 < 8351$
- $2962 > 2098$
- $567 < 5607$
- $\$7.43 > \$6.74$
- $\$0.98 = 98¢$
- $\$1.77 < \$17.01$
- $200 + 50 + 9 = \underline{259}$
- $600 + 10 = \underline{610}$
- $2000 + 600 + 3 = \underline{2603}$
- $4000 + 30 + 8 = \underline{4038}$
- $2 \text{ quarters, } 2 \text{ pennies} = \underline{52¢}$
- $2 \text{ dollars, } 1 \text{ dime} = \underline{\$2.10}$
- $20\ 000 + 5000 + 600 + 9 = \underline{25\ 609}$
- $40\ 000 + 300 = \underline{40\ 300}$
- $80\ 000 + 20 + 7 = \underline{80\ 027}$
- $600\ 000 + 10\ 000 + 50 = \underline{610\ 050}$



Copy and complete the number patterns on the roof



The shingles are bundled in tens.  
How many shingles are in each pile?



What are the missing house numbers?

Round to the nearest ten.

23.  $687 \rightarrow 690$

24.  $7298 \rightarrow 7300$

Round to the nearest hundred.

25.  $6547 \rightarrow 6500$

26.  $6574 \rightarrow 6600$

Write as an ordinal.

27. 12  $12^{\text{th}}$

28. 20  $20^{\text{th}}$

29. 31  $31^{\text{st}}$

30. 83  $83^{\text{rd}}$

31. 102  $102^{\text{nd}}$

Write the standard numeral.

32. VI = 6

33. IX = 9

34. XL = 40

35. LXX = 70

36. XCVIII = 98

## UNIT 1

## PREVIEW

### Suggestions

Review 2-digit place value with the students. Dimes and pennies may be used for place value and counting-on exercises.

$23\text{¢}$   $\textcircled{10\text{¢}}$   $\textcircled{10\text{¢}}$   $\textcircled{1\text{¢}}$   $\textcircled{1\text{¢}}$   $\textcircled{1\text{¢}}$

10, 20, 21, 22, 23

$23\text{¢} = 2 \text{ dimes } 3 \text{ pennies}$

Point out that "23" is called the *standard form* of the numeral.

Show the *tens-and-ones form*

$23 = 2 \text{ tens } 3 \text{ ones}$

and the *expanded form*.

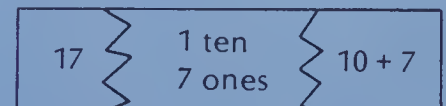
$23 = 20 + 3$

### About the Page

All students should attempt the skill-review exercises on page 1. The top of the page reviews counting by ones, tens, and fives. The exercises at the bottom of the page review the meaning of odd and of even. The students should determine which houses have odd numerals (top or bottom) and which have even numerals before writing the missing house numbers.

### Reinforcement

Have the children make 3-piece jigsaw puzzles as shown below. Give each child a two-digit numeral to write in standard form in the left section. Ask them to write the amount of tens and ones in the middle section and the expanded form in the right section. Check their responses. Ask the children to cut their puzzles into three pieces using wavy lines. Collect all the pieces. Pass out the pieces for the children to reassemble.





# UNIT 1 LESSON 1

## Objective N1

Compare two 2-digit numbers using  $<$ ,  $=$ , or  $>$ .

## Introducing the Lesson

Review the symbols used for comparison with pieces of wood (or sticks) of various lengths. Assign each piece a letter and then ask the students to compare two lengths using these terms.

A is greater than B

B is equal to F

E is less than D

Recall the symbols of comparison and explain how these can be used in the written statements about the pieces of wood.

A  $>$  B      B  $=$  F      E  $<$  D

Ask the class to compare 1-digit numbers and multiples of ten using place value blocks or cards.

4  $>$  3      20  $<$  50

## Teaching the Lesson

Place value blocks may be used to show comparisons of two-digit numbers. First show an example where the tens are the same.

“Which is greater, 35 or 32?”

“Both have the same number of tens, 35 has more ones, so 35 is greater.”

Write on the board:  $35 > 32$

“Which is greater, 35 or 42?”

“42 has more tens, so 42 is greater.”

Write:  $42 > 35$

Show how the symbol can be reversed to mean “less than.”

$35 < 42$       “35 is less than 42.”

Read and discuss the lesson example on page 2 to summarize the procedure for comparing two 2-digit numbers.

It is important that the students first compare the digits in the tens place. If those digits are the same, the digits in the ones place are compared.

Some students may find this memory aid helpful.



## Comparing



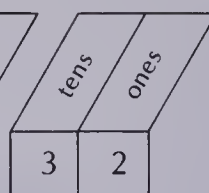
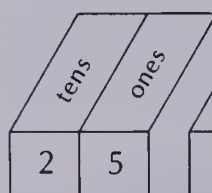
Less than



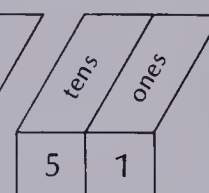
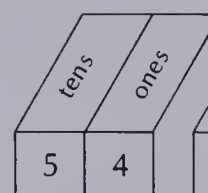
Equal to



Greater than



Compare the tens.  
 $25 < 32$   
because  $20 < 30$ .



Compare the tens.  
If the tens are the same,  
compare the ones.  
 $54 > 51$   
because  $4 > 1$ .

## EXERCISES

Which has more tens?

1. 40 or 60

60

2. 31 or 71

71

3. 92 or 83

92

4. 51 or 59

equal

Which has more ones?

5. 15 or 18

18

6. 22 or 21

22

7. 76 or 77

77

8. 92 or 92

equal

Copy and complete.

Put  $<$ ,  $=$ , or  $>$  in place of the  $\blacksquare$  to make a true statement.

9.  $16 \blacksquare 27 <$

10.  $45 \blacksquare 31 >$

11.  $19 \blacksquare 19 =$

12.  $87 \blacksquare 78 >$

13.  $60 \blacksquare 60 =$

14.  $56 \blacksquare 59 <$

15.  $16 \blacksquare 9 >$

16.  $84 \blacksquare 80 >$

17.  $99 \blacksquare 99 =$

18.  $60 \blacksquare 70 <$

19.  $8 \blacksquare 31 <$

20.  $25 \blacksquare 24 >$

2

## Using the Exercises

Do the Exercises orally with the pupils.

- Questions 1 to 4 require students to focus on the tens, the first step in any comparison of 2-digit numbers.
- Questions 5 to 8 show pairs of 2-digit numbers with the same number of tens. This leads the students to consider only the ones place.
- Questions 9 to 20 mix the previous two types of comparisons. Be sure that students have success with these before assigning the Practice.

## PRACTICE

Make a true number sentence.

Write the letters of all the answers in order, to discover a message.

- |  |  |  |
|--|--|--|
| 1. 88 A                                  | 2. 33 X                                  | 3. 15 I                                  |
| 89 < <input type="checkbox"/> 89 S       | 43 > <input type="checkbox"/> 43 M       | 18 = <input type="checkbox"/> 18 C       |
| <input checked="" type="checkbox"/> 90 E | <input checked="" type="checkbox"/> 53 O | <input checked="" type="checkbox"/> 21 M |
| 4. 45 S                                  | 5. 8 L                                   | 6. 65 A                                  |
| 54 < <input type="checkbox"/> 54 Q       | 8 = <input type="checkbox"/> 18 T        | 71 < <input type="checkbox"/> 70 R       |
| <input checked="" type="checkbox"/> 55 E | <input checked="" type="checkbox"/> 80 W | <input checked="" type="checkbox"/> 75 L |
| 7. 40 E                                  | 8. 61 M                                  | 9. 15 I                                  |
| 50 > <input type="checkbox"/> 50 K       | 62 < <input type="checkbox"/> 62 E       | 21 < <input type="checkbox"/> 20 G       |
| <input checked="" type="checkbox"/> 60 O | <input checked="" type="checkbox"/> 63 N | <input checked="" type="checkbox"/> 25 T |

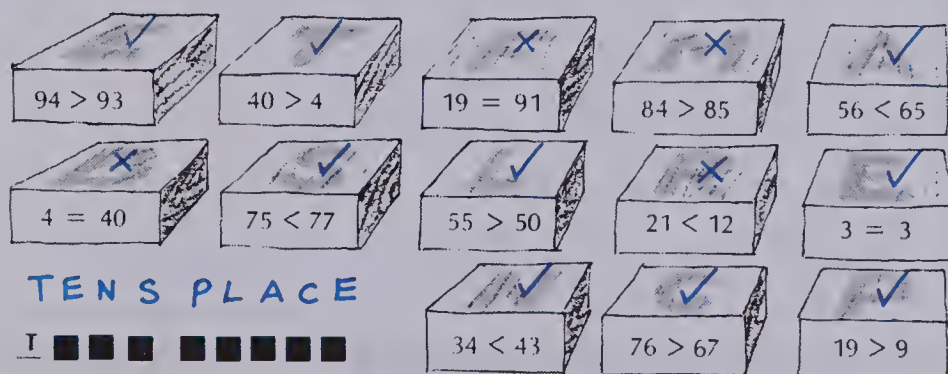
10. Write all the numbers that are greater than 43 and less than 49.  
44, 45, 46, 47, 48

11. Write the numbers between 83 and 88.  
84, 85, 86, 87

## Compare These!

Find each piece of wood on which the number comparison is correct.

Copy these letters. Unscramble them to make two words which are used in our numeration system.



3

## Assigning the Practice

Minimum: 1-11

Average: 1-11

Enriched: 1-11

## Reinforcement

1. Assign *Compare These!* at the bottom of page 3. Choosing the correct comparison statements should not pose problems; however, ordering the letters to form the words *Tens Place* may be difficult for some students.

2. Play a game with bean bags and targets on the floor.



Each student throws 5 bags at the target and counts the score. Comparison problems are involved in determining the winner.

3. Ask the pupils to do the following. Shade all the circles with a letter inside that show a correct comparison.

16 = 16	<input type="radio"/> F	1 > 9	<input type="radio"/> I
12 > 21	<input type="radio"/> I	83 = 85	<input type="radio"/> D
44 > 40	<input type="radio"/> N	37 < 73	<input type="radio"/> H
18 = 18	<input type="radio"/> D	92 < 91	<input type="radio"/> I
5 < 4	<input type="radio"/> D	70 = 07	<input type="radio"/> T

## Enrichment

1. If  $24 < 42$ , circle P.

If not, circle W.

If 8 is 3 more than 5, circle E.

If not, circle R.

If  $31 = 13$ , circle O.

If not, circle R.

If the number which is 12 less than 42 is 30, circle F.

If not, circle N.

If  $96 > 69$ , circle E.

If not, circle G.

If 18 has more tens than 11, circle S. If not, circle C.

If  $50 = 4$  tens and 10 ones, circle T. If not, circle H.

What word have your answers made?

2. Display a collection of nails and screws of varying lengths. Discuss how each type is used in construction work. Assign each a letter and ask the students to write as many comparison statements as they can about them.

A < B or B > A

## Extra Practice

Use <, =, or >.

- |                                |                                |                                |
|--------------------------------|--------------------------------|--------------------------------|
| 1. 16 <input type="radio"/> 61 | 2. 89 <input type="radio"/> 89 | 3. 54 <input type="radio"/> 45 |
| 4. 70 <input type="radio"/> 7  | 5. 24 <input type="radio"/> 25 | 6. 93 <input type="radio"/> 88 |

7. Arrange the numbers in order from smallest to largest.

3, 4, 14, 11, 21, 24, 23

3 4 11 14 21 23 24

8. Arrange the numbers in order from largest to smallest.

75, 72, 74, 69, 70, 64, 62, 67

75 74 72 70 69 67 64 62

## Worksheet N1

Pages 2-3

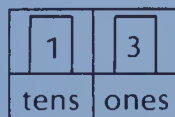
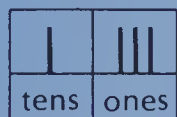
# UNIT 1 LESSON 2

## Objective N2

Extend the numeration system to hundreds.

### Introducing the Lesson

Recall the place value of each digit in a 2-digit numeral by giving the students opportunities to use concrete objects, (place value pocket chart and paper strips, place value blocks, or rubber bands and straws) to illustrate numbers. Have ready three sets of numeral cards from 0 to 9. Say a 2-digit number. Ask the children to illustrate the number by placing the proper number of paper strips in each place value pocket. Then have them form the numerals by placing a numeral card in each pocket.



Repeat this procedure with several other numbers. Review also the concepts of betweenness and the counting order for 2-digit numbers.

### Teaching the Lesson

Extend the concept of grouping by tens to hundreds. Read and discuss the pictorial representation of the number 431 at the top of page 4. Illustrate the number with your place value pocket holder or blocks.

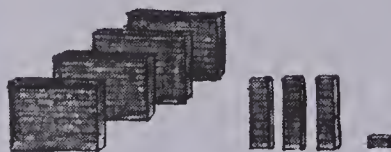
Four flats, three rods, and a cube is 431.



Explain the meaning of expanded form and standard form of a number. Relate this to the place value pockets. Point out also how to write a number using words. Practise illustrating several 3-digit numbers with concrete materials and writing them in expanded form, standard form, and words. Use a place value pocket chart or blocks to show that 3 hundreds, 2 tens, and 5 ones is the same as 2 hundreds, 12 tens, and 5 ones, and the same as 3 hundreds, 1 ten, and 15 ones. Try other examples.

## Hundreds

John has to lay 431 more bricks to finish the driveway.

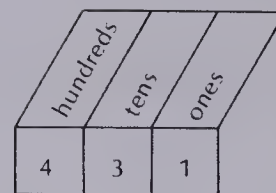


$$400 + 30 + 1$$

Expanded form:  $400 + 30 + 1$

Standard form: 431

Words: four hundred thirty-one



four hundred thirty-one



### EXERCISES

Write in expanded form.

- 387  $300 + 80 + 7$
- 184  $100 + 80 + 4$
- 256  $200 + 50 + 6$
- 851  $800 + 50 + 1$
- 102  $100 + 2$

Write in standard form.

- two hundred twenty-three 223
- five hundred eighty-one 581
- nine hundred four 904
- seven hundred thirty 730
- 5 hundreds + 3 tens + 1 one 531
- 6 hundreds + 6 tens + 6 ones 666
- 2 hundreds + 0 tens + 0 ones 200
- 0 hundreds + 5 tens + 9 ones 59

Write the number of hundreds, tens, and ones

- 316 = 3 hundreds + 1 tens + 6 ones
- 782 = 7 hundreds + 8 tens + 2 ones

Copy and complete using  $<$ ,  $=$ , or  $>$

- 200  $\square$  300  $<$
- 270  $\square$  320  $<$
- 279  $\square$  325  $<$
- 630  $\square$  620  $>$
- 632  $\square$  629  $>$
- 632  $\square$  639  $<$
- 880  $\square$  88  $>$
- 520  $\square$  502  $>$
- 283  $\square$  283  $=$

### Using the Exercises

- Questions 1 to 5 require the writing of 3-digit numerals in expanded form.
- Questions 6 to 15 require the writing of numerals for words and writing numerals in expanded form.
- Questions 16 to 24 are comparisons. Point out that the 3-digit comparisons are just a simple extension of the 2-digit comparisons of Lesson 1. Emphasize the procedure of looking first at hundreds, then at tens, then at ones. The questions are arranged to develop this skill.
- See that the students place the zeros properly in the place value questions.



## PRACTICE

Write in standard form.

1.  $600 + 40 + 8$  648
2.  $200 + 90 + 1$  291
3.  $900 + 70 + 4$  974
4.  $300 + 6$  306
5.  $500 + 50$  550
6.  $80 + 3$  83
7. four hundred two 402
8. eight hundred thirty-one 831
9. one hundred ten 110
10. six hundred seventy-eight 678

Copy and complete using  $<$ ,  $=$ , or  $>$

11.  $48 \blacksquare 49$   $<$
12.  $421 \blacksquare 214$   $>$
13.  $365 \blacksquare 356$   $>$
14.  $804 \blacksquare 840$   $<$
15.  $99 \blacksquare 101$   $<$
16.  $696 \blacksquare 696$   $=$
17.  $101 \blacksquare 401$   $<$
18.  $793 \blacksquare 792$   $>$
19.  $909 \blacksquare 990$   $<$

Write the next ten numerals in the pattern.

20. 356, 357, 358, ... 359, 360...
21. 100, 150, 200, ... 250, 300...
22. 692, 694, 696, ... 698, 700
23. 450, 460, 470, ... 480, 490...

Write the numerals between:

24. 248 and 253 249, 250, 251, 252
25. 396 and 403 397, 398, 399, 401, 402
26. 98 and 104 99, 100, 101, 102, 103

Write the numeral halfway between:

27. 348 and 352 350
28. 580 and 590 585
29. 725 and 731 728

## Debbie's Digits

Debbie changed each number in Column 1 to the number in Column 2.

Figure out what Debbie did to each number.

Do the same thing to the number in Column 3.

	Column 1	Column 2	Column 3	Column 4
1.	158	851	206	? <u>602</u>
2.	370	307	478	? <u>487</u>
3.	692	962	314	? <u>134</u>
4.	446	644	229	? <u>922</u>
5.	253	364	108	? <u>219</u>
6.	246	247	691	? <u>692</u>

5

## Assigning the Practice

Minimum: 1-29

Average: 1-29

Enriched: 1-29

## Reinforcement

Illustrate numbers with place-value cards. Make several sets of the following sizes of cards.

9 cards, 4 cm  $\times$  3 cm (light blue)

9 cards, 4 cm  $\times$  6 cm (yellow)

9 cards, 4 cm  $\times$  9 cm (pink)

On the 4  $\times$  3 cards, write the numerals 1 to 9.

On the 4  $\times$  6 cards, write the multiples of 10, from 10 to 90.

On the 4  $\times$  9 cards, write the multiples of 100, from 100 to 900.

(When writing the numbers, write them large enough so that when three different-sized cards are placed on top of each other, right edges aligned, only the hundreds digit of the bottom card and the tens digit of the middle card will be seen.)

The students can practise making and reading numbers by choosing three cards, one from each set. When the cards are laid down next to each other, they give the expanded form of the number. When they are placed on top of each other, they give the standard form of the number.



also gives:



If students are having difficulty with zeros, have them practise making numbers using only the hundreds and the ones cards.



Ask the students to use the cards to make numbers when given the word form of the number. The students should build up speed at this activity.

## Enrichment

Assign *Debbie's Digits* at the bottom of page 5. Mention that Debbie uses a different rule for each row of numbers. After the children have completed this exercise, discuss each rule used.

## Extra Practice

## Worksheet N2

Pages 4-5

Complete.

1.  $500 + 20 + 9 =$  529
2.  $700 + 60 + 1 =$  761
3.  $100 + 40 + 1 =$  141
4.  $300 + 50 + 7 =$  357
5.  $200 + 3 =$  203
6.  $1 + 500 =$  501
7.  $20 + 8 + 300 =$  328
8.  $7 + 200 + 50 =$  257

Compare.

9. 281  $\odot$  364
10. 302  $\odot$  98
11. 323  $\odot$  332
12. 461  $\odot$  467
13. 342  $\odot$  243
14. 107  $\odot$  100
15. 98  $\odot$  809
16. 485  $\odot$  508
17. 199  $\odot$  199

# UNIT 1 LESSON 3

## Objective N3

Extend the numeration system to thousands.

## Introducing the Lesson

Recall the place value of each digit in a 3-digit number. Use paper strips and place-value pockets as described on page 4, Lesson 2 to make 3-digit numbers and to show their equivalent values. For example, 642 is 6 hundreds, 4 tens, and 2 ones. It is the same as 5 hundreds, 14 tens, 2 ones.

## Teaching the Lesson

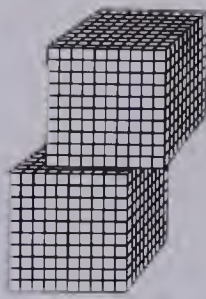
Using place value blocks, extend the concept of grouping by tens and hundreds to thousands. Demonstrate how ten rods can be exchanged for one flat and how ten flats can be exchanged for one block. Allow time for the children to study the block and recognize it as 1000 cubes.

Refer the class to the top of page 6. Discuss how the number 2316 is illustrated with place value blocks. Point out how the expanded form was developed from the blocks. Explain the place value of each digit as shown in the pictured chart. This representation leads to the standard form of the number. Point out also how the number is written in words.

Show how this number and all 4-digit numbers can be written 2 316 or 2316. Both forms are acceptable.

Ask the students to illustrate several 4-digit numbers with place value blocks and then to write each in expanded form at the chalkboard. After several numbers have been written, have the students make comparison statements about the numbers. Require the students to explain why one number is greater or lesser than another.

## Thousands

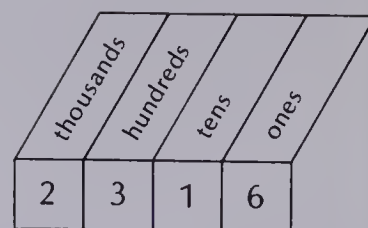


$$2000 + 300 + 10 + 6 = 2316$$

Expanded form:  $2000 + 300 + 10 + 6$

Standard form: 2316

Words: two thousand three hundred sixteen



two thousand  
three hundred  
sixteen

## EXERCISES

What does the 6 in each numeral mean?

1. 6420      2. 8162      3. 6007      4. 9356      5. 6341
- 6 thousands    6 tens    6 thousands    6 ones    6 thousands

Write in expanded form.

6. 9812      7. 1305      8. 7644      9. 5062      10. 8790

Write in standard form.

11. 3 thousands + 6 hundreds + 9 tens + 5 ones    3695
12. 8 thousands + 0 hundreds + 0 tens + 7 ones    8007
13. 0 thousands + 4 hundreds + 2 tens + 2 ones    422
14. one thousand five hundred sixty-eight    1568
15. five thousand two hundred eight    5208
16. nine thousand    9000

Copy and complete using <, =, or >.

17. 2000 ■ 3000 <      18. 1270 ■ 1320 <      19. 4279 ■ 5325 <
20. 9630 ■ 9620 >      21. 5632 ■ 5632 =      22. 4105 ■ 4104 >

- 6 #6 9000 + 800 + 10 + 2    #8 7000 + 600 + 40 + 4
- #7 1000 + 300 + 5    #9 5000 + 60 + 2
- #10 8000 + 700 + 90

## Using the Exercises

- Questions 1 to 5 test the students' present understanding of place value.
- Questions 6 to 16 require their understanding place value to 4 digits. Watch for problems with zero.
- Questions 17 to 22 extend comparisons to 4 digits. Remind the students to look *first* at the digit with the *largest* place value.

## PRACTICE

Write in standard form.

1.  $2000 + 500 + 70 + 9$  **2579**
2.  $6000 + 60$  **6060**
3.  $8000 + 5$  **8005**
4.  $1000 + 100 + 10 + 1$  **1111**
5.  $700 + 90 + 4$  **794**
6.  $3000 + 500$  **3500**
7. nine thousand six hundred nineteen **9619**
8. two thousand two **2002**
9. three thousand two hundred five **3205**
10. one thousand thirty **1030**
11. two thousand two hundred **2200**
12. nine thousand thirty **9030**

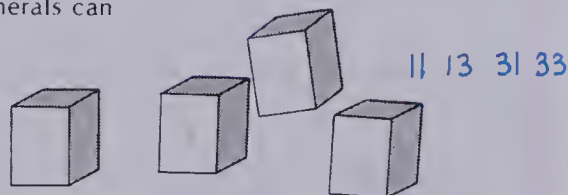
Copy and complete.

Put  $<$ ,  $=$ , or  $>$  in place of the  $\blacksquare$  to make a true statement.

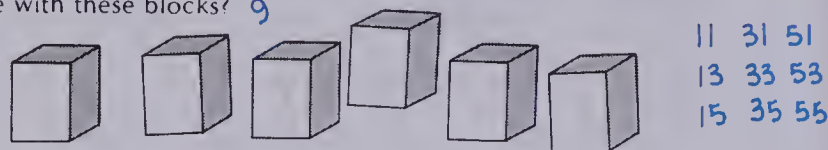
13.  $4835 \blacksquare 5921$   **$<$**
14.  $2106 \blacksquare 2110$   **$<$**
15.  $8014 \blacksquare 8012$   **$>$**
16.  $7008 \blacksquare 7008$   **$=$**
17.  $1110 \blacksquare 999$   **$>$**
18.  $6380 \blacksquare 6384$   **$<$**

## Count the Blocks

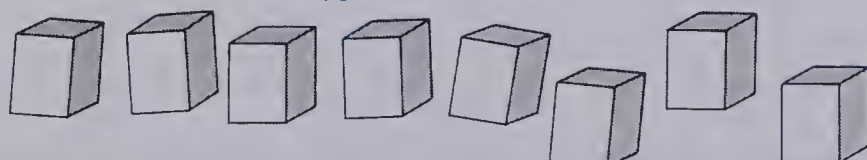
How many different two-digit numerals can you make with these blocks? **4**



How many different two-digit numerals can you make with these blocks? **9**



How many different two-digit numerals can you make with these blocks? **16**



Do you see a pattern?

**11 31 51 71**  
**13 33 53 73**  
**15 35 55 75**  
**17 37 57 77**

7

## Assigning the Practice

Minimum: 1-18

Average: 1-18

Enriched: 1-18

## Reinforcement

1. Play a game similar to Old Maid, but call it Haunted House. Prepare 52 playing cards.

17 numbers written in 3 ways  
(standard form, expanded form, words)

1 Haunted House card

The dealer shuffles and deals out all the cards. Players check to see if they have any sets of three forms of the same number. If they have, they lay them down, face up. The first player draws a card from the person to his or her left. If the card drawn has the same number as two of the cards already held, the player places the three cards on the table. The second player draws from the person to his or her left. Play continues in this way until all the cards have been matched. The person holding the Haunted House card loses.

2. Extend the Reinforcement activity of Lesson 2 by making a set of white cards  $4 \times 12$  cm. Label these 1000, 2000, 3000, ..., 9000. Use these cards with the cards made for Lesson 2 in activities like the ones described there.

## Enrichment

1. Assign *Count the Blocks* at the bottom of page 7. The pattern is the squares of numbers.

**1 1 3 3**  $\rightarrow$  **11, 13, 31, 33**  
4 numerals or  $2^2$

**1 1 3 3 5 5**  $\rightarrow$   
11, 13, 15, 31, 33, 35, 51, 53, 55  
9 numerals or  $3^2$

The blocks in the last row make 16 numerals or  $4^2$ .

2. Hold a Haunted House drawing contest: Display all entries and have the class vote on the winner. The best entry can be used in the Haunted House card game described above in the Reinforcement.

3. Encourage the students to build small models of the Haunted Houses they drew for the contest. Various building materials should be used.

## Extra Practice

## Worksheet N3

Pages 6-7

Complete.

1.  $1000 + 300 + 80 + 7 =$  **1387**
2.  $6000 + 500 + 8 =$  **6508**
3.  $9000 + 800 + 60 + 5 =$  **9865**
4.  $8000 + 70 + 2 =$  **8072**
5.  $3000 + 500 + 10 + 1 =$  **3511**
6.  $2000 + 60 =$  **2060**
7.  $500 + 10 + 1000 + 2 =$  **1512**
8.  $4000 + 9 =$  **4009**
9.  $8 + 200 + 6000 + 20 =$  **6228**
10.  $400 + 3000 =$  **3400**

Compare.

11. 3875  **$<$**  4392
12. 6701  **$<$**  7601
13. 3489  **$<$**  3849
14. 2654  **$>$**  2645
15. 987  **$<$**  1001
16. 4326  **$>$**  3426
17. 3857  **$=$**  3857
18. 2102  **$>$**  2012
19. 648  **$<$**  6048



# UNIT 1 LESSON 4

## Objective M1

Write amounts of money using the dollar sign; relate dollars, dimes, and cents to place value; and compare prices.

## Introducing the Lesson

Discuss the kinds of tools needed for building small items for the home. Using a hardware store catalog or newspaper ad, point out the cost of these tools as you write them on the chalkboard.

Hammer	\$16.99
Screwdriver	\$2.19
Saw	\$10.99
Box of Nails	\$0.95

## Teaching the Lesson

Refer the class to the top of page 8. Write \$42.73 on the chalkboard. Have a student illustrate this amount using play coins and bills. Show how this amount is written in words.

Explain the value of the places for each numeral in \$42.73: 4 is in the ten dollars place; 2 is in the dollars place; 7 is in the dimes place; 3 is in the pennies place.

Using the costs of tools written earlier on the chalkboard, point out the placement of the dollar sign and decimal point for each. Show that the decimal point separates the dollars from the cents and that there are always 2 places to the right of the decimal point. Explain that small amounts can be written two ways.

17¢ or \$0.17      5¢ or \$0.05

Have the students illustrate the costs of the tools with play coins and bills.

Give the students a hardware store catalog. Ask one student to read aloud the cost of an item used in building or constructing, while another student writes the amount on the chalkboard. Point out that when they hear the word "and", they know that that is where the decimal point is.

"One dollar *and* ninety cents."

\$1.90

Students can also make comparison statements about the amounts of money listed on the chalkboard using <, =, and >.

## Dollars and Cents



ten dollars  
\$10



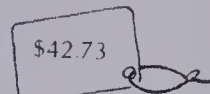
one dollar  
\$1



ten cents  
10¢



one cent  
1¢

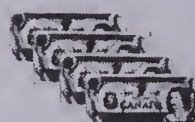


forty-two dollars and seventy-three cents

To show **ninety-five cents** using a dollar sign, write **\$0.95**.

Use a dollar sign to write these prices

1.



\$24.49

2. 18 dollars and 50 cents \$18.50

3. 70 dollars and 15 cents \$70.15

4. 88 dollars \$88.00

5. 88 cents \$0.88

6. 5 dollars and 5 cents \$5.05

7. 0 dollars and 25 cents \$0.25

Write >, <, or = for ●

8. \$6.00 ● \$7.00 <

9. \$17.20 ● \$13.20 >

10. \$68.35 ● \$68.45 <

11. \$10.75 ● \$10.72 >

12. \$0.68 ● \$0.78 <

13. \$0.75 ● 75¢ =

## Using the Exercises

- In questions 1 to 7, watch for problems with zeros and with the placement of the decimal point.
- In comparison questions 8 to 13, remind the students to look *first* at the ten dollars place. In addition, they must take care in placing the decimal point and in using the correct symbol, \$ or ¢.

## PRACTICE

Use a dollar sign.

1. 35 dollars and 10 cents **\$35.10**
2. 89 cents **\$0.89**
3. 89 dollars and 2 cents **\$89.02**
4. 75 dollars **\$75.00**
5. 60 dollars and 60 cents **\$60.60**
6. 2 cents **\$0.02**

Write  $>$ ,  $<$ , or  $=$  for  $\bullet$ .

7. \$68.95  $\bullet$  \$69.98  **$<$**
8. \$7.43  $\bullet$  \$7.49  **$<$**
9. \$18.05  $\bullet$  \$29.98  **$<$**
10. \$0.69  $\bullet$  \$2.01  **$<$**
11. \$85.00  $\bullet$  \$58.99  **$>$**
12. \$0.06  $\bullet$  5 cents  **$>$**
13. \$3.45  $\bullet$  \$3.61  **$<$**
14. \$25  $\bullet$  25 dollars  **$=$**
15. \$6.01  $\bullet$  \$5.99  **$>$**

Solve.

16. Nails are sold by the kilogram.  
They cost \$5.97 at Bob's Lumber.  
They cost \$5.79 at Trudy's Hardware.  
Where should Carpenter Jack buy his nails? **Trudy's Hardware**
17. Which costs more: ten tiles for \$4.00 or twenty tiles for \$7.00?

## REVIEW

Copy and complete.

Put  $<$ ,  $=$ , or  $>$  in place of  $\blacksquare$  to make a true statement.

1. 64  $\blacksquare$  46  **$>$**
2. 31  $\blacksquare$  32  **$<$**
3. 50  $\blacksquare$  5  **$>$**
4. 71  $\blacksquare$  71  **$=$**
5. 84  $\blacksquare$  85  **$<$**
6. 21  $\blacksquare$  12  **$>$**

Write in standard form.

7. five hundred twenty-one **521**
8. nine hundred nine **909**
9. two hundred fourteen **214**
10. seven hundred **700**

Write the place value of the 4 in each numeral.

11. 2400 **4 hundreds**
12. 4189 **4 thousands**
13. 3745 **4 tens**
14. 6964 **4 ones**

9

## Assigning the Practice

Minimum: 1-15

Average: 1-16

Enriched: 1-17

## Review Exercises

Questions	Objective	Pages
1-6	N1	2-3
7-10	N2	4-5
11-14	N3	6-7

## Reinforcement

Provide a container of play money and two lists of amounts of money:

- a. in standard form (\$48.13, \$6.15)
- b. in words (3 dollars and 42 cents).

The students are to make the amounts of money using play bills and coins.

## Enrichment

Set up a money activity centre with a place-value holder, a calculator, writing materials, play money, store catalogs, supermarket flyers from the newspaper, a menu, a cookbook, advertising from take-out restaurants. Activities similar to the following can be worked at in the money centre.

1. Ask the children to make a shopping list using the food advertisements from the newspaper. Then have them total the amount of money needed for their groceries with a calculator. Ask them to count out the amount using play money.

2. Have a group of students plan the menu for a meal for the whole class. They are to decide how much money would be needed to buy the necessary food.

3. Have students bring in unused food coupons. Students can choose 5 or 6 at a time, represent the amount of each coupon with play money, and total the amounts.

## Extra Practice

## Worksheet M1

Pages 8-9

Write the price.

1. 1 dime, 5 pennies = 15¢
2. 1 dime, 1 nickel = 15¢
3. 2 quarters = 50¢
4. 1 quarter, 1 nickel, 1 penny = 31¢
5. 4 quarters = \$1.00 or 100¢
6. 3 quarters, 2 nickels, 4 pennies = 89¢
7. 2 dollars, 20 cents = \$2.20
8. 3 dollars, 5 cents = \$3.05

Compare.

9. \$5.02  **$>$**  \$4.99
10. \$3.98  **$>$**  \$3.89
11. \$6.75  **$<$**  \$6.77
12. \$7.45  **$<$**  \$8.04
13. \$0.10  **$=$**  10¢
14. \$0.10  **$<$**  \$10

# UNIT 1 LESSON 5

## Objective N4

Extend the numeration system to hundred thousands.

## Introducing the Lesson

Continuing with the construction theme, begin a discussion of the Egyptian pyramids. Use pictures or a film-strip to show the magnificent tombs that were built. Point out especially the Great Pyramid built for the Pharaoh, Khufu. Discuss the difficulties of this colossal chore which was completed within Khufu's 23-year reign in about 2600 B.C.

## Teaching the Lesson

Refer the class to the top of page 10. Explain that it took a long time to move the large stone blocks because of their mass (nearly 1300 kg each) and the lack of lifting equipment.

Write the numeral 325 619 on the chalkboard. Point out the two new place value positions: *ten thousand* and *hundred thousand*. Talk about the value of each of the six places. Emphasize that the pattern of grouping by tens is continued.

10 ones = 1 ten

10 tens = 1 hundred

10 hundreds = 1 thousand

10 thousands = 1 ten thousand

10 ten thousands = 1 hundred thousand

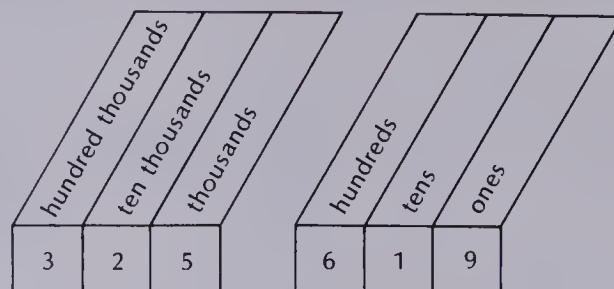
A place-value pocket chart and paper strips can be used to illustrate the number 325 619.

100 000	10 000	1000	100	10	1

Point out how the expanded form of the number is found. For the standard form of the number, draw the students' attention to the space between the hundreds and thousands place, thus grouping the digits in threes. As the students look at the numeral 325 619 written in words at the top of page 10, point out that there is no "and". Recall from the previous lesson that the "and" signified a decimal point.

## Hundred Thousands

The Egyptians took nearly two years to move 325 619 blocks for building the Great Pyramid.



Expanded form:  $300\,000 + 20\,000 + 5\,000 + 600 + 10 + 9$

Standard form: 325 619

Words: three hundred twenty-five thousand six hundred nineteen

## EXERCISES

In the numeral 481 235

- Which digit is in the hundreds place? **2**
- Which digit is in the hundred-thousands place? **4**
- Which digit is in the tens place? **3**

Write in standard form.

- Write a 4-digit numeral with a 5 in the thousands place. **ex. 5000**
- Write a 6-digit numeral with a 1 in the ten-thousands place. **ex. 310 000**
- Write a 5-digit numeral with an 8 in the hundreds place. **ex. 10 800**
- Write a 6-digit numeral with a 2 in the hundred-thousands place. **ex. 200 000**

Write in expanded form.

- 823 704  **$800\,000 + 20\,000 + 3\,000 + 700 + 4$**
- 196 528
- 90 145
- 3768

10

**9.  $100\,000 + 90\,000 + 6\,000 + 500 + 20 + 8$**

**10.  $90\,000 + 100 + 40 + 5$**

**11.  $3\,000 + 700 + 60 + 8$**

## Using the Exercises

- Do questions 1 to 3 orally. These exercises are a simple extension of the earlier lessons.
- As the numbers become larger, watch for the correct number of zeros in each part of the expanded form.



## PRACTICE

Write a numeral in standard form.

- fifty-two thousand six hundred eighty-seven **52 687**
- four hundred ninety-five thousand one hundred thirteen **495 113**
- thirty-three thousand three **33 003**
- nine hundred thousand nine hundred **900 900**
- eight hundred forty thousand ninety-two **840 092**

Write in standard form.

- 140 306**
- 30 303**
- 701 050**
- 600 010**

Copy and complete.

Put <, =, or > in place of the ■ to make a true statement.

- 346 108 ■ 299 875 **>**
- 67 224 ■ 67 226 **<**
- 596 000 ■ 596 001 **<**
- 19 283 ■ 19 283 **=**
- 510 009 ■ 509 999 **>**
- 280 101 ■ 281 011 **<**

## Picture Power

Arithmetic was very important in early times.

Numerals as we know them today were not used. The

Egyptians used a different set of symbols to show numbers.

They did not use place value, so many repetitions were needed to write simple numerals.

1	/	staff
10	∩	heel bone
100	∩∩	scroll
1000	⊗	lotus flower

∩	∩∩∩	////
100 + 60 + 8 = 168		

Write these Egyptian numerals using our system.

- 47**
- 222**
- 881**
- 1133**

Write these using Egyptian numerals.

- 483
- 126
- 579
- 1314
- 3245

## Extra Practice

## Worksheet N4

Pages 10-11

Complete.

- 69 423**
- 751 084**
- 208 503**
- 100 109**
- 620 021**
- 504 002**

Compare.

- <**
- <**
- <**
- <**
- <**
- <**

## Assigning the Practice

Minimum: 1-15

Average: 1-15

Enriched: 1-15

## Reinforcement

1. Play number baseball. Divide the class into two teams. The batter goes to the chalkboard and writes in standard form a number given by the opposing pitcher. A correct answer is a hit and puts the batter on first base; an incorrect answer is an out. Three outs retires the side batting. Team members take turns batting and pitching. A diagram on the board may help to keep track of the plays. One student can be assigned to change the numbers on the scoreboard.

2. Extend the Reinforcement activity of Lesson 2, page 5, by making these cards.

4 cm × 15 cm cards, labelled 10 000, 20 000, 30 000, ..., 90 000.

4 cm × 18 cm cards, labelled 100 000, 200 000, 300 000, ..., 900 000.

Use these with the existing cards in activities like the ones described on page 5.

## Enrichment

1. The *Picture Power* exercise at the bottom of page 11 introduces students to the Egyptian numeration system and to a little history of the development of mathematics.

2. Students can invent a number system using the symbols and rules of their choice. Charts, equations, graphs, and rules might be put on posters for others to try.

3. Have some students research the building of the Great Pyramid. Encourage them to write a story about or illustrate their findings. Display their work.

4. Some students may be able to explore number systems in other bases (base 2, base 5). This will reinforce their understanding of place value.

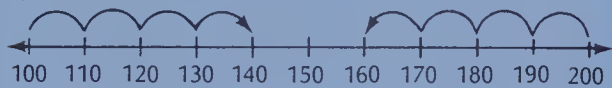
# UNIT 1 LESSON 6

## Objective N5

Round to the nearest ten, hundred, or thousand.

### Introducing the Lesson

Review the concepts *between* and *halfway between*. Have the children use centimetre rulers to find the numbers between 10 and 20. Because the numbers are equally spaced, the children can easily mark off the numbers in pairs, one from each end: 11 (closest to 10) and 19 (closest to 20); then 12 and 18; and so on, to emphasize that 15 is halfway between 10 and 20. Use a number line to make the same point for hundreds.

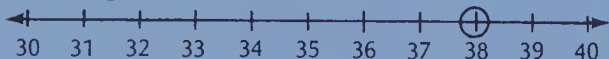


### Teaching the Lesson

Use the lesson example on the top of page 12 as an introduction to rounding to the nearest ten and hundred.

Explain that rounding a number to the **nearest ten** means writing it as the multiple of ten to which it is closest in value.

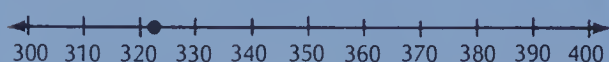
Demonstrate this on a number line. 38 rounds up to 40. It is closer to 40 than to 30.



35 rounds up to 40. It is halfway between 30 and 40. Whenever a number is halfway between it rounds up.

With a number line, illustrate rounding to the **nearest hundred**.

322 rounds down to 300. It is closer to 300 than to 400.

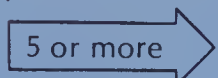


Another way of looking at rounding to the **nearest hundred** might be as shown in the example:

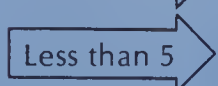
675 rounds up to 700.



Point your pencil to the hundreds place and look at the tens place digit.

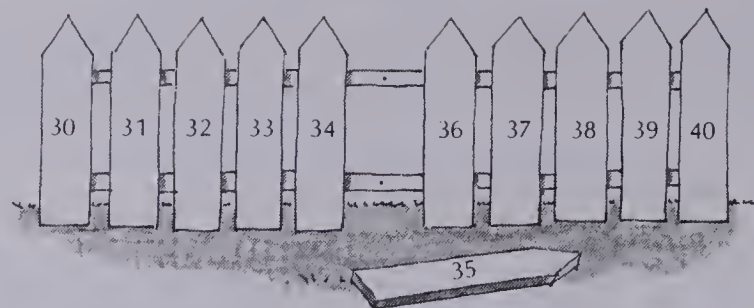


Round up.



Round down.

## Rounding



32 is between 30 and 40. 32 rounds to 30.

38 is between 30 and 40. 38 rounds to 40.

35 is halfway between 30 and 40.

A number halfway between two numbers is rounded to the larger number.

35 rounds to 40.

Round to the nearest ten.

1. 82 is between 80 and 90. 82 rounds to 80.
2. 23 is between 20 and 30. 23 rounds to 20.
3. 66 is between 60 and 70. 66 rounds to 70.
4. 45 is between 40 and 50. 45 rounds to 50.
5. 98 is between 90 and 100. 98 rounds to 100.

Round to the nearest hundred.

6. 226 is between 200 and 300. 226 rounds to 200.
7. 589 is between 500 and 600. 589 rounds to 600.
8. 707 is between 700 and 800. 707 rounds to 700.
9. 550 is between 500 and 600. 550 rounds to 600.
10. 94 is between 90 and 100. 94 rounds to 100.

### Using the Exercises

- Do questions 1 to 10 orally to establish a method to use when rounding.
- Questions 6 to 10 extend the objective to hundreds. Explain that the procedure is essentially the same. The students must look at the digit on the right of the one being rounded: if the number is 5 or more, round up; if the number is 4 or less, round down.



## PRACTICE

Round to the nearest ten.

1. 18 20 2. 57 60 3. 96 100 4. 75 80 5. 14 10
6. 26 30 7. 41 40 8. 85 90 9. 108 110 10. 126 130
11. 111 110 12. 865 870 13. 350 350 14. 649 650 15. 273 270
16. 1062 1060 17. 4382 4380 18. 5555 5560 19. 3009 3010 20. 7297 7300

Round to the nearest hundred.

21. 111 100 22. 865 900 23. 350 400 24. 649 600 25. 273 300
26. 421 400 27. 608 600 28. 528 500 29. 973 1000 30. 89 100
31. 2641 2600 32. 9036 9000 33. 7418 7400 34. 3030 3000 35. 5050 5100
36. 25 483 25 500 37. 69 104 69 100 38. 218 472 218 500 39. 40 090 40 100 40. 293 951 294 000

41. For questions 31 to 40, round each to the nearest thousand

31. 3000 32. 9000 33. 7000 34. 3000 35. 5000
36. 25 000 37. 69 000 38. 218 000 39. 40 000 40. 294 000

42. The highest point in Canada is Mount Logan.

It is 5951 m high.

How high is Mount Logan to the nearest ten metres? 5950 m

to the nearest hundred metres? to the nearest thousand metres?

6000 m

6000 m

## Square Numbers

1, 4, and 9 are called square numbers. Can you guess why?



Find all the square numbers up to 100.

16, 25, 36, 49, 64, 81

13

## Assigning the Practice

Minimum: 1-30

Average: 1-42

Enriched: 11-42

## Reinforcement

1. Make a worksheet chart like the one below for more rounding practice.

	Round to the nearest hundred.	Round to the nearest ten.
26 374		
737 625		
8 852		
905 296		
1 548		
96 101		
402 729		
385 469		

2. Play a rounding game. For the gameboard you will need a 30 cm x 35 cm sheet of bristol board. In the centre of the board glue a picture of a professional athlete (from any sports magazine) with the caption: Be a Pro. Know the Rules.

Place stickers next to each other, all around the board. Make a start and a finish. Put a number to be rounded on each sticker (if the exercise is one in rounding to ten, use such numbers as 86, 147, 3628, 33; if it is in rounding to the nearest 100, use such numbers as 346, 7861, 14 043).

Two people play. Roll the die to see who goes first. Player A rolls the die, moves his or her marker along the stickers as far as the number shown on the die, and then rounds the number found on the sticker on which he or she lands. If the answer is correct, his or her marker may remain on that sticker; if incorrect, the marker must be returned to the start. Player B then rolls and repeats the procedure. The first player to finish is the winner.

## Enrichment

Assign *Square Numbers* at the bottom of page 13. Students should think of a square number as being in the form of a square with sides of length  $N$ .  $N \times N$  is the area.

## Extra Practice

## Worksheet N5

Pages 12-13

Round to the nearest ten.

1. 512  $\rightarrow$  510 2. 356  $\rightarrow$  360 3. 889  $\rightarrow$  890
4. 1088  $\rightarrow$  1090 5. 4832  $\rightarrow$  4830 6. 2002  $\rightarrow$  2000
7. 38 145  $\rightarrow$  38 150 8. 75 005  $\rightarrow$  75 010 9. 21 944  $\rightarrow$  21 940

Round to the nearest hundred.

10. 6853  $\rightarrow$  6900 11. 1708  $\rightarrow$  1700 12. 2030  $\rightarrow$  2000
13. 41 760  $\rightarrow$  41 800 14. 93 060  $\rightarrow$  93 100 15. 45 019  $\rightarrow$  45 000
16. 259 106  $\rightarrow$  259 100 17. 300 505  $\rightarrow$  300 500 18. 980 951  $\rightarrow$  981 000

Round to the nearest thousand.

19. 21 008  $\rightarrow$  21 000 20. 12 975  $\rightarrow$  13 000 21. 489 502  $\rightarrow$  490 000



# UNIT 1 LESSON 7

## Objective N6

Read and write ordinal numbers.

## Introducing the Lesson

Ask the students for the date. Discuss why we say, for example, "the third" instead of "three." Explain that when numbers are used to identify order they are called ordinal numbers. We need ordinal numbers to distinguish order from quantity. Have the students give examples of uses of ordinal numbers (finishing positions in a competition, the order in which tasks are done, floor designations in buildings, and so on).

## Teaching the Lesson

Ask the students to look at the section of a city map shown in the lesson example at the top of page 14. Explain that many cities use ordinal numbers to designate streets and avenues. If possible, draw the map of Caryton on the chalkboard. Point out each avenue and street. Ask the children to locate the streets that are not labelled (all odd numbers) and the avenues that are not labelled (all even numbers). As they locate these streets and avenues, they can label them on the chalkboard map with the short forms of ordinal numbers.

With the students, develop a list of ordinal numbers, using both words and numerals.

first	1st
second	2nd
third	3rd
...	
tenth	10th

Continue the list, grouping each set of ten numbers in columns next to each other, so the students can see the pattern.

eleventh	11th
twelfth	12th
...	

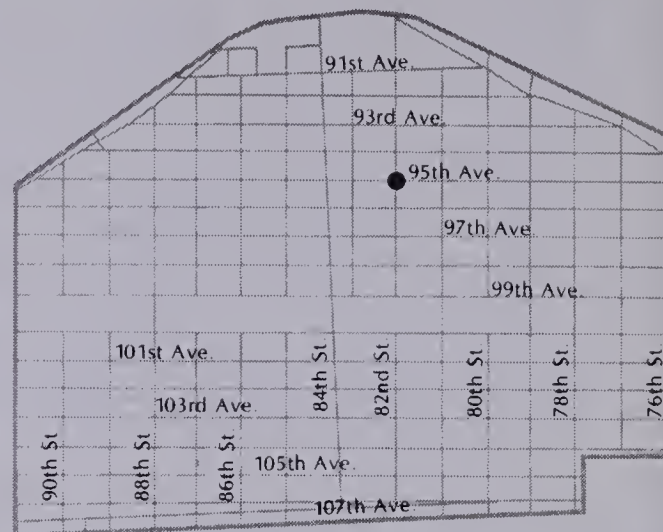
Emphasize the pattern used to name ordinals after the twentieth: succeeding numbers follow the pattern of the first ten ordinal numbers.

twenty-first	21st
twenty-second	22nd ...

## Ordinal Numbers

Here is a section of a map of Caryton. The streets and avenues use ordinal numbers.

I live at 95th Avenue and 82nd Street.



95th is a short way of writing ninety-fifth.

82nd is a short way of writing eighty-second.

## EXERCISES

Write each the short way.

- |                           |       |                  |      |
|---------------------------|-------|------------------|------|
| 1. one hundred thirteenth | 113th | 2. eighteenth    | 18th |
| 3. fifty-fifth            | 55th  | 4. sixty-first   | 61st |
| 5. ninety-third           | 93rd  | 6. thirty-second | 32nd |
| 7. six hundred tenth      | 610th | 8. twentieth     | 20th |

Write each as an ordinal number.

Use words and the short way.

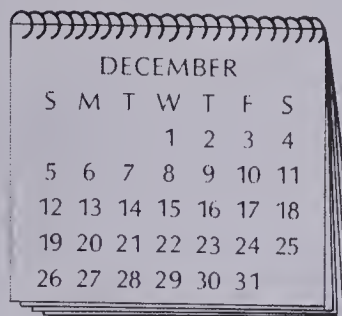
- |       |      |        |      |        |      |        |      |         |       |
|-------|------|--------|------|--------|------|--------|------|---------|-------|
| 9. 26 | 26th | 10. 34 | 34th | 11. 47 | 47th | 12. 52 | 52nd | 13. 62  | 62nd  |
| 14. 3 | 3rd  | 15. 5  | 5th  | 16. 21 | 21st | 17. 30 | 30th | 18. 101 | 101st |

## Using the Exercises

- Work through the questions with the students and be sure they are familiar with the four different short-form endings: the most frequently used -th and the three others: -st, -nd, and -rd. Discuss with them when the latter three endings are used.

## PRACTICE

Use ordinal numbers to answer the questions.



- On what date does the first Friday of December occur? 3rd
- What four dates in December are Mondays? 6th, 13th, 20th, 27th
- What date is the fourth Wednesday in December? 22nd
- Read the dates for each day of the month.

The pictures show sets of elevator buttons. The passengers have pushed the buttons that are coloured. On what floors will the elevators stop?

5. 7th, 10th, 11th

6. 75th, 78th

7. 43rd, 44th, 46th, 49th

## Golly

All of these are Gollys

4124 3672 6148 5336 2920 1234

None of these are Gollys.

8 1235 23 516 650 11 2221

Which of these are Gollys?

1224 3 292 1350 4321 6548 89

15

## Assigning the Practice

Minimum: 1-7

Average: 1-7

Enriched: 1-7

## Reinforcement

1. Use a telephone directory as a guide in a treasure hunt. For example, Clue 1 might be page 65, the seventy-second name; page 214 the sixteenth name. (The names are "Look" and "Underwood".) The second clue is placed under a piece of wood somewhere in the classroom. Clue 2 might be page 50, the 21st name; page 153, the 93rd name. (The names are "Hyde" and "Sunnyside".) The third clue is by the window blinds or curtains. And so on.

2. Here are the directions for a game your students can play with younger children. Draw several upright figures (man, lady, bear, dinosaur, dragon) of about the same size on separate sheets of paper. (Each sheet is predivided by two horizontal lines into 3 sections so that all heads will be drawn in the top section; all bodies will be drawn in the middle section; and all legs and feet will be drawn in the bottom section.) Staple the sheets together on the left side. Cut through all the sheets on the two horizontal lines, almost up to the staples, so that the pages are in three sections. Play a game with the children. Ask them to put the first head with the second body and the fourth feet. Have them make different creatures with other combinations of heads, bodies, and legs.

## Enrichment

1. Assign the Golly exercise at the bottom of page 15. A "Golly" is an even, 4-digit number.

2. Ask the students to research the steps involved in building a simple bird house or bird feeder and then to write these steps down on a large sheet of stiff paper using ordinal numbers. Students may also wish to illustrate the steps. Display the results in your classroom.

## Extra Practice

## Worksheet N6

Pages 14-15

Write the next ordinal.

- 65th 66th
- 332nd 333rd
- 24th 25th
- 99th 100th
- 107th 108th
- 43rd 44th

Write in words.

- 489th four hundred eighty-ninth
- 72nd seventy-second
- 151st one hundred fifty-first
- 23rd twenty-third

What comes before?

- 49th 50th
- 30th 31st
- 99th 100th
- 997th 998th
- 39th 40th
- 201st 202nd



# UNIT 1 LESSON 8

## Objective N7

Read and write Roman numerals I to C.

## Introducing the Lesson

Discuss with the students some of the very early methods of counting. Point out that pebbles, kernels of grain, twigs, and scratches on stones were some of the first things used for counting. Later, the Egyptians, Babylonians, Romans, and Greeks developed their own symbols for numbers. Ask the students to name ways Roman numerals are used today (the volumes of a set of books; numbers on a clock face; dates on building cornerstones; numbers after a king's or queen's name).

## Teaching the Lesson

Point out the symbols for numbers that the Romans used given at the top of page 16. Explain that these five symbols are used to write the numbers up to 100.

Write the numbers to 10 on the chalkboard in Roman and standard numerals. Show how the Roman number system has no place value. Point out especially how IV and IX are written. Explain that when a smaller symbol precedes a larger symbol, the numbers are subtracted.

$$IV = 5 - 1 \text{ or } 4 \quad IX = 10 - 1 \text{ or } 9$$

This method of writing certain numerals enabled the Romans to write numbers with fewer symbols: IV, not IIII

Explain that a symbol may be repeated at most three times in a row. Have the students notice how 14 and 19 are written. Ask them to speculate on how 24 and 29 or 34 and 39 are written.

Introduce the symbols L and C. Have someone count by tens in Roman numerals at the chalkboard. Point out the subtraction in the symbols for 40 and 90.

$$XL = 50 - 10 \text{ or } 40 \quad XC = 100 - 10 \text{ or } 90$$

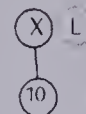
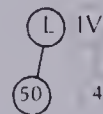
Write several Roman numerals on the chalkboard. Have the students look for familiar groups and then write them in standard form.

$$LXXIX \quad 70 + 9 = 79$$

## Reading Roman Numerals

I	V	X	L	C
1	5	10	50	100

Look for the number groups you know



Large number first: Add.

L I V

$$50 + 4 = 54$$

Small number first: Subtract

X L

$$50 - 10 = 40$$

## EXERCISES

- Write the Roman numerals for 1 to 10.

1	2	3	4	5	6	7	8	9	10
I	II	III	IV	V	VI	VII	VIII	IX	X

- Write the Roman numerals for 11 to 20.

11	12	13	14	15	16	17	18	19	20
XI	XII	XIII	XIV	XV	XVI	XVII	XVIII	XIX	XX

Write the numeral in standard form.

3. II	2	4. V	5	5. IV	4	6. VII	7	7. X	10
8. III	3	9. VI	6	10. XII	12	11. XV	15	12. XVIII	18
13. XXX	30	14. XXII	22	15. XXV	25	16. XXVIII	28	17. XXIX	29
18. L	50	19. LIII	53	20. LV	55	21. LIV	54	22. LX	60
23. LVI	56	24. LI	51	25. LXX	70	26. LXXV	75	27. LXXXVII	87
28. LIX	59	29. XL	40	30. C	100	31. XC	90	32. XCIII	93

- Count by tens in Roman numerals.

10	20	30	40	50	60	70	80	90	100
X	XX	XXX	XL	L	LX	LXX	LXXX	XC	C

16

## Using the Exercises

- In questions 1 and 2 the students write the first 20 Roman numerals in order.
- Discuss patterns that will emerge in forming numerals beyond 20. Ask what happens when we reach 40, 50, 60, 90, and so on.
- Work through questions 3 to 32 orally and discuss any difficult ones.
- In question 33, the children summarize all the multiples of 10 to 100. This will give them a handy reference chart to aid in doing the Practice exercises.



## PRACTICE

Write a numeral in standard form for each Roman numeral.  
Crack the code by writing the letter corresponding to the number in the row below.

IX    ■    E    9    XIX    ■    E    19    XXIV    ■    M    24  
XXXIII    ■    S    33    XLVII    ■    P    47    LVIII    ■    R    58  
LXVI    ■    T    66    LXXIV    ■    E    74    LXXXI    ■    B    81

■    E    ■    ■    ■    ■    ■    ■  
33    9    47    66    19    24    81    74    58  
S    E    P    T    E    M    B    E    R



## REVIEW

Write in expanded form.

- 23 671    2. 104 603    3. 68 004    4. 758 249  
 $20\ 000 + 3\ 000 + 600 + 70 + 1$      $100\ 000 + 4\ 000 + 600 + 3$   
 $2$     3.  $60\ 000 + 8\ 000 + 4$     4.  $700\ 000 + 50\ 000 + 8\ 000 + 200 + 40 + 9$
- Write in standard form.  
5. four hundred sixty-five thousand eight hundred forty-three  
6. one hundred fifty-two thousand twenty-one    152 021    465 843  
7. seventy-four thousand two hundred eight    74 208

Round to the nearest ten.

- 44    40    9. 321    320    10. 695    700    11. 2804    2800

Round to the nearest hundred and to the nearest thousand.

- 1349    1300    1000    13. 1851    1900    2000    14. 2760    2800    3000    15. 3950    4000

Write each in words as an ordinal.

- 29    17. 63    18. 121    19. 15

- twenty-ninth    18. one hundred twenty-first    17
- sixty-third    19. fifteenth

## Extra Practice

Write the standard numeral.

- XIX = 29    2. XXXVI = 36    3. XXIV = 24
- XXVI = 26    5. LII = 52    6. LIX = 59
- LXIV = 64    8. LXXII = 72    9. XCV = 95
- LXXX = 80    11. XLVI = 46    12. XLIV = 44

Write the Roman numeral.

- 23 = XXIII    14. 32 = XXXII    15. 71 = LXXI
- 84 = LXXXIV    17. 45 = XLV    18. 67 = LXVII
- 98 = XCVIII    20. 79 = LXXIX    21. 55 = LV

## Worksheet N7

Pages 16-17

## Assigning the Practice

Minimum: all

Average: all

Enriched: all

## Review Exercises

Questions	Objective	Pages
1-7	N4	10-11
8-15	N5	12-13
16-19	N6	14-15

## Reinforcement

1. Ask the students to choose an article with sports scores from the sports section of the local newspaper and to rewrite the article using Roman numerals in place of standard numbers.

2. Have the students make a calendar for the current month using Roman numerals.

## Enrichment

1. Ask the students to make up simple addition and subtraction problems for 2-digit numbers. Then ask them to rewrite each problem using Roman numerals and to try to solve the problems. Have them tell what difficulties they encountered in trying to perform the operations.

2. Assign a library research project on the development of Roman numerals and the origin of the symbols used in that system.

3. Some students might write poems or stories explaining why they think Roman numerals are not (or should be) used very much today.

# UNIT 1 LESSON 9

## Objective PS1

Read and interpret statistical charts and tables.

## Introducing the Lesson

Survey the everyday uses of charts and tables to present information (in newspapers, in reports, in textbooks, and on television). Charts and tables have been made about almost every aspect of our lives. Many of them help us to make practical decisions.

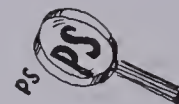
## Teaching the Lesson

Refer the class to the chart on page 18. Discuss the information given. Work through the first question with the pupils to show the organization of the figures in terms of the rows and columns. Carefully analyse the question to show why the search begins with the 1972 column and the British Columbia row, and ends with their intersection. This vertical-horizontal strategy is the correct approach to all reading and interpretation of charts and tables. Allow the students to complete the second and third parts of question 1. Then proceed to discuss question 2. The search begins with the 1967 column, goes down to the largest number, and then across to Ontario. The same must be done for 1972 and for 1977. Then, the figures for the three years are compared to find that the number for Ontario, 1972, is the largest. Again, allow the pupils to finish the second part of the question on their own. Continue in this fashion with the remaining questions. Call the students' attention to the fact that questions 5 and 6 involve a row search rather than a column search. The emphasis in this lesson should be on the importance and usefulness of a routine or strategy. The student will become confident in problem-solving situations only if he or she is process-oriented.

## Enrichment

Have the children make bar graphs of Canadian home construction for each of the three years given in the chart on page 18.

## Reading Charts



This chart shows the number of homes built in Canada in three different years (it includes houses and apartments).

Regions of Canada:	1967	1972	1977
Atlantic provinces	7 410	15 000	17 778
Quebec	39 108	53 466	61 979
Ontario	58 278	96 438	80 717
Prairie provinces	22 720	36 226	58 084
British Columbia	21 726	31 097	33 231



Answer these questions from the information in the chart:

- How many homes were built in British Columbia in 1972? **31 097**  
How many homes were built in Quebec in 1967? **39 108**  
In 1977, how many homes were built in the Atlantic provinces? **17 778**
- When and where were the most houses built? **Ontario 1972**  
When and where were the fewest houses built? **Atlantic Prov. 1967**
- Arrange the 1977 figures in order from least to most construction.  
**Atlantic, B.C., Prairies, Que., Ont.**
- How many regions built more than 50 000 homes in 1967? **Ontario (1)**  
How many in 1972? **2** How many in 1977? **3**
- Where were fewer houses built in 1977 than in 1972? **Ontario**
- Which region had the biggest increase from 1972 to 1977? **Prairie Prov.**

18

## Post-test

## Unit 1

Complete.

- 49 **>** 48
- 36 **<** 63
- 57 **<** 71
- 138 **=** 138
- 457 **<** 475
- 308 **>** 280
- 6527 **>** 6258
- 2875 **<** 3750
- 6809 **>** 698
- \$7.55 **>** \$5.77
- \$2.05 **<** \$2.50
- \$16.03 **>** \$6.23
- $600 + 40 + 9 =$  **649**
- $800 + 7 =$  **807**
- $5000 + 700 + 10 + 8 =$  **5718**
- $3000 + 200 + 4 =$  **3204**
- 3 quarters, 1 dime = **85¢**
- 18 dollars, 2 cents = **\$18.02**
- $10\ 000 + 5000 + 600 + 20 + 9 =$  **15 629**
- $40\ 000 + 700 + 10 + 8 =$  **40 718**
- $90\ 000 + 600 + 50 =$  **90 650**
- $800\ 000 + 4000 + 600 + 30 + 7 =$  **804 637**

# UNIT 1

# TEST

Copy and complete.

Use  $<$ ,  $=$ , or  $>$  to make a true statement.

1.  $39 \blacksquare 38$   $>$
2.  $17 \blacksquare 71$   $<$
3.  $46 \blacksquare 46$   $=$
4.  $125 \blacksquare 152$   $<$
5.  $436 \blacksquare 335$   $>$
6.  $284 \blacksquare 340$   $<$
7.  $3865 \blacksquare 4981$   $<$
8.  $2398 \blacksquare 2389$   $>$
9.  $9465 \blacksquare 9501$   $<$
10.  $\$6.89 \blacksquare \$6.98$   $<$
11.  $\$16.25 \blacksquare \$15.99$   $>$
12.  $\$38.49 \blacksquare \$78.99$   $<$

Write in standard form.

13. 5 hundreds + 3 tens + 0 ones  $\overset{500}{530}$
14. 1 hundred + 0 tens + 0 ones  $\overset{100}{100}$
15. four thousand six hundred fifteen  $\overset{4000}{4615}$
16. nine thousand nine  $\overset{9000}{9009}$

Write using a dollar sign.

17. 18 dollars and 2 cents  $\$18.02$
18. 50 dollars and 99 cents  $\$50.99$

Write in expanded form.

19. 12 790  $10\,000 + 2\,000 + 700 + 90$
20. 50 104  $50\,000 + 100 + 4$
21. 364 825  $300\,000 + 60\,000 + 4\,000 + 800 + 20 + 5$
22. 800 600  $800\,000 + 600$

Round to the nearest ten. Round to the nearest hundred.

23. 6149  $\overset{6150}{6100}$
24. 25 451  $\overset{25\,450}{25\,500}$
25. 93 783  $\overset{93\,780}{93\,800}$
26. 417 008  $\overset{417\,010}{417\,000}$

Write each as an ordinal number.

Use words and the short way.

27. 31  $\overset{thirty-first}{31^{st}}$
28. 18  $\overset{eighteenth}{18^{th}}$
29. 52  $\overset{fifty-second}{52^{nd}}$
30. 93  $\overset{ninety-third}{93^{rd}}$
31. 301  $\overset{three hundred first}{301^{st}}$

Write the Roman numeral for each of these.

32. 9  $\overset{IX}{IX}$
33. 34  $\overset{XXXIV}{XXXIV}$
34. 47  $\overset{XLVII}{XLVII}$
35. 62  $\overset{LXII}{LXII}$
36. 111  $\overset{CXI}{CXI}$

Unit 1 Objectives	Test Questions	Pages
N1	1-3	2-3
N2	4-6, 13, 14	4-5
N3	7-9, 15, 16	6-7
M1	10-12, 17, 18	8-9
N4	19-22	10-11
N5	23-26	12-13
N6	27-31	14-15
N7	32-36	16-17

Round to the nearest ten.

23. 685  $\rightarrow$  690
24. 1098  $\rightarrow$  1100

Round to the nearest hundred.

25. 2949  $\rightarrow$  2900
26. 48 657  $\rightarrow$  48 700

Write as an ordinal.

27. 11 11<sup>th</sup>
28. 62 62<sup>nd</sup>
29. 38 38<sup>th</sup>
30. 51 51<sup>st</sup>
31. 303 303<sup>rd</sup>

Write the standard numeral.

32. IV = 4
33. XIX = 19
34. XXVI = 26
35. XC = 90
36. LXXXIII = 83



# UNIT 2

## Addition and Subtraction

Theme: Stamps

Lesson		Objective	Pages
Preview		Recall addition and subtraction facts to 9.	21
1	A1	Recall addition and subtraction facts to 13.	22-23
2	A2	Recall addition and subtraction facts to 18.	24-25
3	A3	Add two-digit numbers without regrouping.	26-27
4	A4	Add a two-digit and a one-digit number with regrouping.	28-29
5	A5	Add three addends.	30-31
6	A6	Subtract two-digit numbers without regrouping.	32-33
7	A7	Subtract a one-digit number from a two-digit number with regrouping.	34-35
8	A8	Add and subtract three-digit numbers without regrouping.	36-37
9	PS2	Recognize words and phrases associated with addition and subtraction problems.	38-39
10	M2	Measure temperature in degrees Celsius.	40-41
Test		Addition and subtraction.	42
Review		Numerals to 999 999	43

# About This Unit

The aim of this unit is:

1. to re-establish skills in adding and subtracting one-, two-, and three-digit numbers without regrouping;
2. to re-establish skills in adding and subtracting two-digit and one-digit numbers with regrouping.

The lessons are arranged in a developmental sequence and should be covered in that order for maximum benefit.

The teaching strategy develops addition and subtraction skills that do *not* require more than one regrouping, so that these algorithms become firmly established. Each lesson builds on skills developed in the previous lesson. The lessons are introduced using concrete materials and are extended to the algorithm. Emphasis is given to developing problem-solving skills in which addition and subtraction skills are applied.

Whenever possible, concrete materials should be used to introduce the skill illustrated in the lesson example. It is important that the student understand and learn each algorithm. If a student shows weaknesses in the basic addition and subtraction facts, he or she should be given remediation and encouraged to use a temporary crutch, such as a calculator or an addition fact table.

# Ideas

The theme of this unit is stamps. Find out if there are any stamp collectors among the students. If there are, have them bring in their collections to show the class. Use the collections to create problems for the students. Look for duplication of the same types of stamps, or ask how many stamps there are from a given country in all the collections.

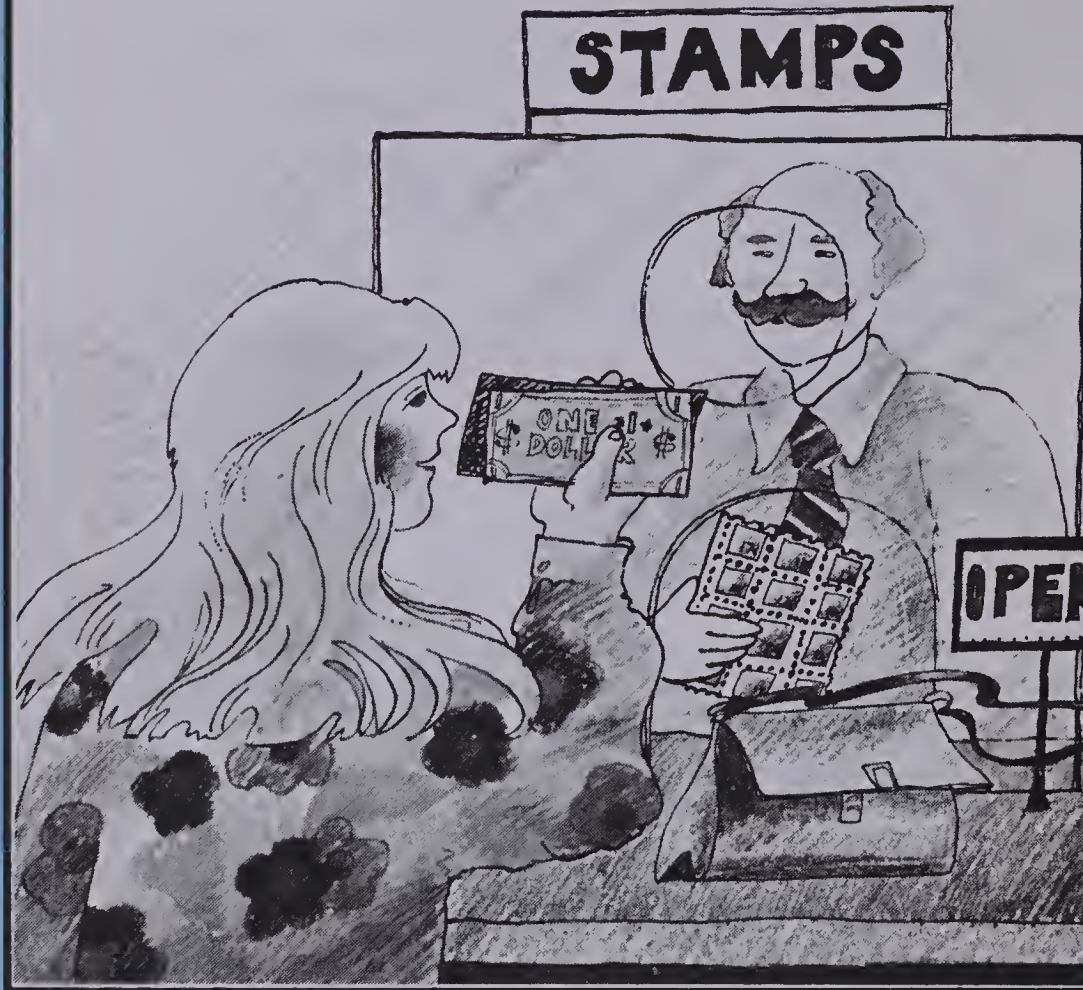
Find examples appropriate to the lesson plans of this unit and use them to stimulate interest in the lessons.

If you are able to borrow sheets of perforated stamps from the office, use them to demonstrate subtraction examples. Find out how many are in a whole sheet and tear off given numbers of stamps.

Start a bulletin board display. Even if there are no collectors in the class, children can still start saving stamps from the mail at home and bring them in for the display.

# UNIT 2

## ADDITION AND SUBTRACTION



Unit 2 Objective	Test Questions	Pages
A1	1-2, 8	22-23
A2	3-7, 9	24-25
A3	10-11	26-27
A4	15-17, 27	28-29
A5	20-26	30-31
A6	12-14	32-33
A7	18-19, 28	34-35
A8	29-33	36-37
PS	34-36	

### Pretest

Add or subtract.

### Unit 2

- $$\begin{array}{r} 6 \\ +6 \\ \hline 12 \end{array}$$
- $$\begin{array}{r} 11 \\ - 8 \\ \hline 3 \end{array}$$
- $$\begin{array}{r} 7 \\ +7 \\ \hline 14 \end{array}$$
- $$\begin{array}{r} 8 \\ +9 \\ \hline 17 \end{array}$$
- $$\begin{array}{r} 15 \\ - 6 \\ \hline 9 \end{array}$$
- $5 + 8 = 13$
- $4 + 9 = 13$
- $10 - 7 = 3$
- $18 - 9 = 9$
- $$\begin{array}{r} 41 \\ +26 \\ \hline 67 \end{array}$$
- $$\begin{array}{r} 92 \\ + 7 \\ \hline 99 \end{array}$$
- $$\begin{array}{r} 35 \\ - 12 \\ \hline 23 \end{array}$$
- $$\begin{array}{r} 87 \\ - 36 \\ \hline 51 \end{array}$$
- $$\begin{array}{r} 48 \\ - 18 \\ \hline 30 \end{array}$$
- $$\begin{array}{r} 27 \\ + 9 \\ \hline 36 \end{array}$$
- $$\begin{array}{r} 43 \\ + 8 \\ \hline 51 \end{array}$$
- $$\begin{array}{r} 25 \\ + 5 \\ \hline 30 \end{array}$$
- $$\begin{array}{r} 36 \\ - 7 \\ \hline 29 \end{array}$$
- $$\begin{array}{r} 51 \\ - 4 \\ \hline 47 \end{array}$$
- $$\begin{array}{r} 2 \\ +2 \\ \hline 10 \end{array}$$
- $$\begin{array}{r} 9 \\ +8 \\ \hline 17 \end{array}$$
- $$\begin{array}{r} 5 \\ +7 \\ \hline 16 \end{array}$$
- $$\begin{array}{r} 32 \\ +26 \\ \hline 98 \end{array}$$
- $$\begin{array}{r} 67 \\ +31 \\ \hline 98 \end{array}$$



# Collecting Stamps

How much for these stamps?

$$\begin{array}{r} 5\text{¢} \\ + 3\text{¢} \\ \hline 8\text{¢} \end{array}$$



How much change?

$$\begin{array}{r} 5\text{¢} \\ - 3\text{¢} \\ \hline 2\text{¢} \end{array}$$



Add.

1. $\begin{array}{r} 1 \\ + 1 \\ \hline 2 \end{array}$	2. $\begin{array}{r} 4 \\ + 2 \\ \hline 6 \end{array}$	3. $\begin{array}{r} 7 \\ + 2 \\ \hline 9 \end{array}$
4. $\begin{array}{r} 1 \\ + 3 \\ \hline 4 \end{array}$	5. $\begin{array}{r} 2 \\ + 6 \\ \hline 8 \end{array}$	6. $\begin{array}{r} 3 \\ + 4 \\ \hline 7 \end{array}$
7. $\begin{array}{r} 4 \\ + 5 \\ \hline 9 \end{array}$	8. $\begin{array}{r} 6 \\ + 3 \\ \hline 9 \end{array}$	9. $\begin{array}{r} 5 \\ + 2 \\ \hline 7 \end{array}$

Subtract.

1. $\begin{array}{r} 2 \\ - 1 \\ \hline 1 \end{array}$	2. $\begin{array}{r} 6 \\ - 2 \\ \hline 4 \end{array}$	3. $\begin{array}{r} 9 \\ - 2 \\ \hline 7 \end{array}$
4. $\begin{array}{r} 4 \\ - 3 \\ \hline 1 \end{array}$	5. $\begin{array}{r} 8 \\ - 6 \\ \hline 2 \end{array}$	6. $\begin{array}{r} 7 \\ - 3 \\ \hline 4 \end{array}$
7. $\begin{array}{r} 9 \\ - 5 \\ \hline 4 \end{array}$	8. $\begin{array}{r} 9 \\ - 3 \\ \hline 6 \end{array}$	9. $\begin{array}{r} 7 \\ - 2 \\ \hline 5 \end{array}$

## UNIT 2 PREVIEW

### Suggestions

Begin a discussion about stamps. Have a collection of stamps ready so the various designs or motifs can be pointed out. Discuss the cost of a regular postage stamp, post card stamp, and foreign postage stamp. Ask why we have a need for stamps of 1¢, 2¢, 3¢, etc.

Discuss stamp collecting and encourage the students to bring in and display their collections. You might also ask the students to bring in unusual stamps that they receive in the mail for classroom display.

### About the Page

All students should attempt the skill-review exercises on page 21. The questions review basic addition and subtraction facts from 0 to 9. If some students have difficulty with this page, more drill of basic skills is necessary before proceeding with the rest of the unit.

Each fact in the subtraction square is *related* to the fact with the same number in the addition square. The students should be made aware of this relationship upon completion of the two stamp squares.

### Reinforcement

Direct the students to make a list of addition names for the numbers 0 to 9. Once this list is completed they can also write the related subtraction facts.

25.  $5 + 9 + 7 = \underline{21}$

26.  $62 + 13 + 21 = \underline{96}$

27.  $78 + 5 = \underline{83}$

28.  $54 - 8 = \underline{46}$

29.  $\begin{array}{r} 123 \\ + 362 \\ \hline 485 \end{array}$

30.  $\begin{array}{r} 481 \\ + 17 \\ \hline 498 \end{array}$

31.  $\begin{array}{r} 635 \\ + 103 \\ \hline 738 \end{array}$

32.  $\begin{array}{r} 825 \\ - 122 \\ \hline 703 \end{array}$

33.  $\begin{array}{r} 348 \\ - 206 \\ \hline 142 \end{array}$

Solve.

34. Ellen had 10¢. She bought a charm for 8¢. How much change did she get?  $\underline{2\text{¢}}$

35. Steve answered 17 questions right and 8 wrong on his math test. How many questions were there?  $\underline{25}$

36. Jo had 88 candies. She ate 53 before she got sick. How many does she still have?  $\underline{35}$

Addition Names		
4	5	6
2 + 2	3 + 2	3 + 3
3 + 1	4 + 1	4 + 2
4 + 0	5 + 0	5 + 1
		6 + 0
Related Subtraction Facts		
4 - 2 = 2	5 - 3 = 2	6 - 3 = 3
4 - 3 = 1	5 - 4 = 1	6 - 4 = 2
4 - 4 = 0	5 - 5 = 0	6 - 5 = 1
		6 - 6 = 0

# UNIT 2 LESSON 1

## Objective A1

Recall addition and subtraction facts to 13.

## Introducing the Lesson

Ask the students to use sticks, blocks, or other concrete objects to show addition facts to 9. Then direct them to make  $9 + 1$  with their objects. Ask them how many objects there are in all. When the total number of objects has been found, ask the students to form the **related** subtraction sentence ( $10 - 1 = 9$ ) using the same objects. Then repeat the procedure for other combinations of numbers to 13.

## Teaching the Lesson

Use the lesson example on page 22 to discuss the **related sentences** that the stamps show. Use patterns, "doubles," and "doubles plus one" to develop the facts to 13.

"doubles" "doubles plus one"

$5 + 5$   $5 + 6$   
 $6 + 6$   $6 + 7$

$5 + 5$   $13 - 5$   
 $5 + 6$   $13 - 6$   
 $5 + 7$   $13 - 7$   
 $5 + 8$   $13 - 8$

$5 + 5$   $10 - 5$   
 $6 + 4$   $10 - 4$   
 $7 + 3$   $10 - 3$   
 $8 + 2$   $10 - 2$   
 $9 + 1$   $10 - 1$

$2 + 9$   $11 - 2$   $6 + 6$   $12 - 6$   
 $3 + 8$   $11 - 3$   $5 + 7$   $12 - 5$   
 $4 + 7$   $11 - 4$   $4 + 8$   $12 - 4$   
 $5 + 6$   $11 - 5$   $3 + 9$   $12 - 3$

Emphasize *commutativity* (not by name) by showing addition facts in pairs and asking if addends in a different order give the same sum.

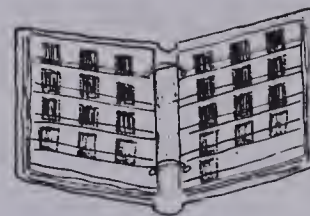
$$6 + 5 = 5 + 6$$

Extend this to subtraction. Have students discover that addition is commutative and subtraction is not.

## Facts to 13



$$\begin{array}{r} 9 \\ + 1 \\ \hline 10 \end{array} \quad \begin{array}{r} 9 \\ + 2 \\ \hline 11 \end{array}$$



$$\begin{array}{r} 12 \\ - 3 \\ \hline 9 \end{array} \quad \begin{array}{r} 13 \\ - 4 \\ \hline 9 \end{array}$$

## EXERCISES

Add.

- |   |   |   |   |  |
|---|---|---|---|--|
| 1. $\begin{array}{r} 9 \\ + 1 \\ \hline 10 \end{array}$ | 2. $\begin{array}{r} 9 \\ + 2 \\ \hline 11 \end{array}$ | 3. $\begin{array}{r} 8 \\ + 2 \\ \hline 10 \end{array}$ | 4. $\begin{array}{r} 9 \\ + 3 \\ \hline 12 \end{array}$ | 5. $\begin{array}{r} 8 \\ + 3 \\ \hline 11 \end{array}$  |
| 6. $\begin{array}{r} 9 \\ + 4 \\ \hline 13 \end{array}$ | 7. $\begin{array}{r} 8 \\ + 4 \\ \hline 12 \end{array}$ | 8. $\begin{array}{r} 7 \\ + 4 \\ \hline 11 \end{array}$ | 9. $\begin{array}{r} 8 \\ + 5 \\ \hline 13 \end{array}$ | 10. $\begin{array}{r} 7 \\ + 5 \\ \hline 12 \end{array}$ |
| 11. $6 + 5$ 11  | 12. $5 + 5$ 10  | 13. $7 + 6$ 13  | 14. $6 + 6$ 12  |  |
| 15. $5 + 6$ 11  | 16. $4 + 6$ 10  | 17. $5 + 8$ 13  | 18. $4 + 9$ 13  |  |

Subtract.

- |  |  |  |  |
|--|--|--|--|
| 19. $\begin{array}{r} 10 \\ - 5 \\ \hline 5 \end{array}$ | 20. $\begin{array}{r} 11 \\ - 5 \\ \hline 6 \end{array}$ | 21. $\begin{array}{r} 12 \\ - 5 \\ \hline 7 \end{array}$ | 22. $\begin{array}{r} 13 \\ - 5 \\ \hline 8 \end{array}$ |
| 23. $\begin{array}{r} 10 \\ - 6 \\ \hline 4 \end{array}$ | 24. $\begin{array}{r} 11 \\ - 6 \\ \hline 5 \end{array}$ | 25. $\begin{array}{r} 12 \\ - 6 \\ \hline 6 \end{array}$ | 26. $\begin{array}{r} 13 \\ - 6 \\ \hline 7 \end{array}$ |
| 27. $\begin{array}{r} 10 \\ - 7 \\ \hline 3 \end{array}$ | 28. $\begin{array}{r} 11 \\ - 7 \\ \hline 4 \end{array}$ | 29. $\begin{array}{r} 12 \\ - 7 \\ \hline 5 \end{array}$ | 30. $\begin{array}{r} 13 \\ - 7 \\ \hline 6 \end{array}$ |
| 31. $10 - 8$ 2   | 32. $11 - 8$ 3   | 33. $12 - 8$ 4   | 34. $13 - 8$ 5   |
| 35. $10 - 9$ 1   | 36. $11 - 9$ 2   | 37. $12 - 9$ 3   | 38. $13 - 9$ 4   |

22

## Using the Exercises

- Use the exercises as a quick quiz to determine weaknesses in basic-fact recall. Students having any difficulty at all should be assigned some systematic drill in the facts for 10, 11, 12, and 13.

## PRACTICE

Add or subtract.

1.  $\begin{array}{r} 8 \\ +4 \\ \hline 12 \end{array}$
2.  $\begin{array}{r} 5 \\ +5 \\ \hline 10 \end{array}$
3.  $\begin{array}{r} 9 \\ +4 \\ \hline 13 \end{array}$
4.  $\begin{array}{r} 8 \\ +3 \\ \hline 11 \end{array}$
5.  $\begin{array}{r} 6 \\ +7 \\ \hline 13 \end{array}$
6.  $\begin{array}{r} 12 \\ -8 \\ \hline 4 \end{array}$
7.  $\begin{array}{r} 10 \\ -6 \\ \hline 4 \end{array}$
8.  $\begin{array}{r} 13 \\ -7 \\ \hline 6 \end{array}$
9.  $\begin{array}{r} 12 \\ -9 \\ \hline 3 \end{array}$
10.  $\begin{array}{r} 11 \\ -8 \\ \hline 3 \end{array}$
11.  $9 + 2 = 11$
12.  $8 + 5 = 13$
13.  $6 + 4 = 10$
14.  $7 + 3 = 10$
15.  $5 + 7 = 12$
16.  $9 + 3 = 12$
17.  $13 - 5 = 8$
18.  $10 - 8 = 2$
19.  $12 - 7 = 5$
20.  $13 - 8 = 5$
21.  $13 - 6 = 7$
22.  $12 - 5 = 7$

Solve.

23. 6 Swedish stamps saved  
6 Spanish stamps saved  
How many stamps were saved in all? **12**
24. 10 Jamaican stamps  
7 Brazilian stamps  
How many more Jamaican than Brazilian stamps? **3**
25. Jody had 12¢. She bought a 5¢ stamp.  
How much money did she have left? **7¢**
26. A school stamp club had 7 boys and 6 girls as members.  
How many members did the club have? **13**

## Lights Out

John and Reuben live across the street from each other. Both have a red light, a yellow light, and a blue light. The boys can signal each other through the window by using different combinations of lights. They use 1, 2, or 3 lights for a signal. How many different signals can they make? **7**



23

## Extra Practice

Add or subtract.

1.  $\begin{array}{r} 11 \\ -3 \\ \hline 8 \end{array}$
2.  $\begin{array}{r} 6 \\ +5 \\ \hline 11 \end{array}$
3.  $\begin{array}{r} 13 \\ -5 \\ \hline 8 \end{array}$
4.  $\begin{array}{r} 8 \\ +2 \\ \hline 10 \end{array}$
5.  $\begin{array}{r} 4 \\ +9 \\ \hline 13 \end{array}$
6.  $\begin{array}{r} 12 \\ -4 \\ \hline 8 \end{array}$
7.  $\begin{array}{r} 6 \\ +6 \\ \hline 12 \end{array}$
8.  $\begin{array}{r} 10 \\ -7 \\ \hline 3 \end{array}$
9.  $\begin{array}{r} 4 \\ +7 \\ \hline 11 \end{array}$
10.  $\begin{array}{r} 12 \\ -7 \\ \hline 5 \end{array}$
11.  $9 + 4 = 13$
12.  $10 - 1 = 9$
13.  $6 + 7 = 13$
14.  $12 - 5 = 7$

Solve.

15. Jerry has 8 marbles in his bag. He wants to buy 5 more.  
How many marbles would he have then? **13**
16. Marsha bought a dozen cookies. She and a friend ate 7.  
How many cookies were left? **5**

## Worksheet A1

Pages 22-23

## Assigning the Practice

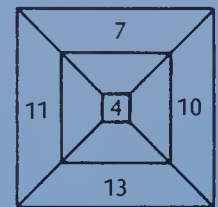
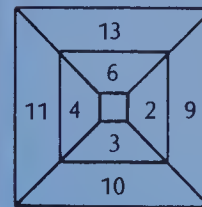
Minimum: 1-26

Average: 1-26

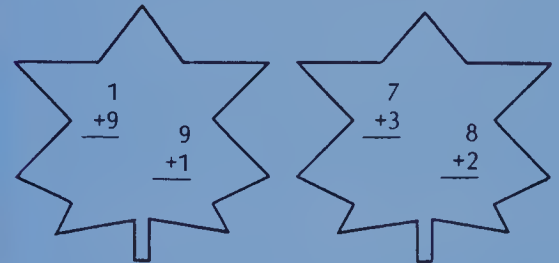
Enriched: 1-26

## Reinforcement

1. Students may enjoy making subtraction squares that require the insertion of specific numbers to be complete. Read the subtraction statements from the outer square to the centre.



2. Make a bulletin board display of an addition tree. Ask the students to cut out leaves from construction paper and to write number pairs on them. Pin the leaves on the tree limbs.



3. Take a blank cube and label it 9, 8, 7, 6, 5, 4. Two players take turns rolling the die, the higher roller goes first and is player A. Player A rolls the die again and gets, say, 6. That player must subtract the number rolled from 13 and give the answer.

$$13 - 6 = 7$$

If correct, the player scores 2 points. If incorrect, the player loses 1 point. The first player to get 13 points or more is the winner.

## Enrichment

Assign *Lights Out*. A diagram or chart will help to demonstrate that 7 different signals can be made, using three coloured lights.

R	x	x	x	x	o	o	o
Y	o	x	x	o	x	x	o
B	o	o	x	x	x	o	x



# UNIT 2 LESSON 2

## Objective A2

Recall addition and subtraction facts to 18.

## Introducing the Lesson

Review the basic addition and subtraction facts to 13 learned in Lesson 1. Demonstrate the *commutative property of addition*.

$$3 + 5 = 5 + 3$$

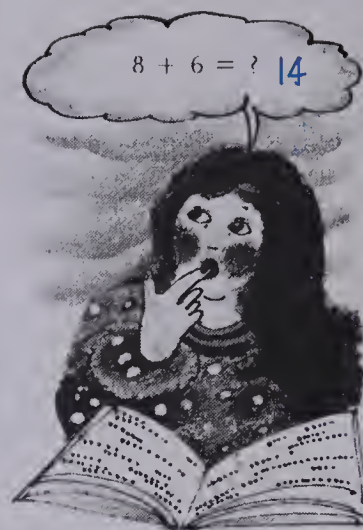
Provide a worksheet of a blank addition table for the facts up to  $9 + 9$  and ask the students to complete the table for the facts they know. Point out the *symmetry* in the table and stress that learning the facts for one-half of the table means knowing the facts for the other half. The symmetrical pairs illustrate the commutative property.

## Teaching the Lesson

Work with the students to complete the addition table using patterns to discover answers. Reinforce these facts with counters. To emphasize the symmetry of the table, ask students to shade in the  $6 + 9$  and  $9 + 6$  squares, the  $2 + 8$  and  $8 + 2$  squares, and so on.

## Facts to 18

+	0	1	2	3	4	5	6	7	8	9
0	0	1	2	3	4	5	6	7	8	9
1	1	2	3	4	5	6	7	8	9	10
2	2	3	4	5	6	7	8	9	10	11
3	3	4	5	6	7	8	9	10	11	12
4	4	5	6	7	8	9	10	11	12	13
5	5	6	7	8	9	10	11	12	13	
6	6	7	8	9	10	11	12	13		
7	7	8	9	10	11	12	13			
8	8	9	10	11	12	13				
9	9	10	11	12	13					



## EXERCISES

Add or subtract.

1.  $\begin{array}{r} 3 \\ + 5 \\ \hline 8 \end{array}$
2.  $\begin{array}{r} 4 \\ + 4 \\ \hline 8 \end{array}$
3.  $\begin{array}{r} 5 \\ + 2 \\ \hline 7 \end{array}$
4.  $\begin{array}{r} 0 \\ + 8 \\ \hline 8 \end{array}$
5.  $\begin{array}{r} 2 \\ + 7 \\ \hline 9 \end{array}$
6.  $\begin{array}{r} 7 \\ + 6 \\ \hline 13 \end{array}$
7.  $\begin{array}{r} 5 \\ + 8 \\ \hline 13 \end{array}$
8.  $\begin{array}{r} 4 \\ + 8 \\ \hline 12 \end{array}$
9.  $\begin{array}{r} 6 \\ + 6 \\ \hline 12 \end{array}$
10.  $\begin{array}{r} 9 \\ + 4 \\ \hline 13 \end{array}$
11.  $7 + 7 = 14$
12.  $8 + 9 = 17$
13.  $9 + 9 = 18$
14.  $8 + 6 = 14$
15.  $8 + 8 = 16$
16.  $9 + 7 = 16$
17.  $6 + 9 = 15$
18.  $8 + 6 = 14$
19.  $9 + 5 = 14$
20.  $7 + 8 = 15$
21.  $\begin{array}{r} 8 \\ - 4 \\ \hline 4 \end{array}$
22.  $\begin{array}{r} 5 \\ - 0 \\ \hline 5 \end{array}$
23.  $\begin{array}{r} 9 \\ - 5 \\ \hline 4 \end{array}$
24.  $\begin{array}{r} 7 \\ - 2 \\ \hline 5 \end{array}$
25.  $\begin{array}{r} 13 \\ - 6 \\ \hline 7 \end{array}$
26.  $\begin{array}{r} 12 \\ - 7 \\ \hline 5 \end{array}$
27.  $\begin{array}{r} 13 \\ - 5 \\ \hline 8 \end{array}$
28.  $\begin{array}{r} 12 \\ - 9 \\ \hline 3 \end{array}$
29.  $\begin{array}{r} 11 \\ - 4 \\ \hline 7 \end{array}$
30.  $\begin{array}{r} 11 \\ - 6 \\ \hline 5 \end{array}$
31.  $18 - 9 = 9$
32.  $14 - 8 = 6$
33.  $15 - 7 = 8$
34.  $17 - 8 = 9$
35.  $15 - 9 = 6$
36.  $17 - 9 = 8$
37.  $16 - 8 = 8$
38.  $16 - 7 = 9$
39.  $15 - 9 = 6$
40.  $14 - 7 = 7$

## Using the Exercises

- Questions 1 to 10 and 21 to 30 provide a quick review of number facts to 13.
- Questions 11 to 20 and 31 to 40 extend the facts to 18. Be sure the students have a strong grasp of the basic facts before proceeding with the rest of this unit.

## PRACTICE

Add or subtract.

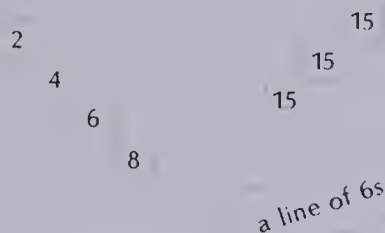
1.  $\begin{array}{r} 9 \\ +8 \\ \hline 17 \end{array}$
2.  $\begin{array}{r} 5 \\ +7 \\ \hline 12 \end{array}$
3.  $\begin{array}{r} 6 \\ +6 \\ \hline 12 \end{array}$
4.  $\begin{array}{r} 3 \\ +4 \\ \hline 7 \end{array}$
5.  $\begin{array}{r} 9 \\ +3 \\ \hline 12 \end{array}$
6.  $\begin{array}{r} 17 \\ -9 \\ \hline 8 \end{array}$
7.  $\begin{array}{r} 15 \\ -8 \\ \hline 7 \end{array}$
8.  $\begin{array}{r} 13 \\ -5 \\ \hline 8 \end{array}$
9.  $\begin{array}{r} 11 \\ -7 \\ \hline 4 \end{array}$
10.  $\begin{array}{r} 8 \\ -0 \\ \hline 8 \end{array}$
11.  $0 + 7 = 7$
12.  $8 + 8 = 16$
13.  $5 + 9 = 14$
14.  $6 + 5 = 11$
15.  $16 - 9 = 7$
16.  $14 - 5 = 9$
17.  $12 - 4 = 8$
18.  $17 - 8 = 9$
19.  $\begin{array}{r} 9 \\ +9 \\ \hline 18 \end{array}$
20.  $\begin{array}{r} 7 \\ +8 \\ \hline 15 \end{array}$
21.  $\begin{array}{r} 9 \\ +7 \\ \hline 16 \end{array}$
22.  $\begin{array}{r} 6 \\ +9 \\ \hline 15 \end{array}$
23.  $\begin{array}{r} 8 \\ +6 \\ \hline 14 \end{array}$
24.  $\begin{array}{r} 18 \\ -9 \\ \hline 9 \end{array}$
25.  $\begin{array}{r} 16 \\ -7 \\ \hline 9 \end{array}$
26.  $\begin{array}{r} 17 \\ -9 \\ \hline 8 \end{array}$
27.  $\begin{array}{r} 15 \\ -9 \\ \hline 6 \end{array}$
28.  $\begin{array}{r} 14 \\ -8 \\ \hline 6 \end{array}$

Solve.

29. When the stamp club met, there were only 7 chairs for the 12 members. How many more chairs were needed? **5**
30. The stamp club met every Thursday. There were 4 Thursdays in April and 5 Thursdays in May. How many times did the club meet in the two months? **9**

## Pattern Puzzle

Make an addition table.  
Look for hidden patterns in it.  
Show the patterns you can find.



25

## Assigning the Practice

Minimum: 1-30

Average: 1-30

Enriched: 1-30

## Reinforcement

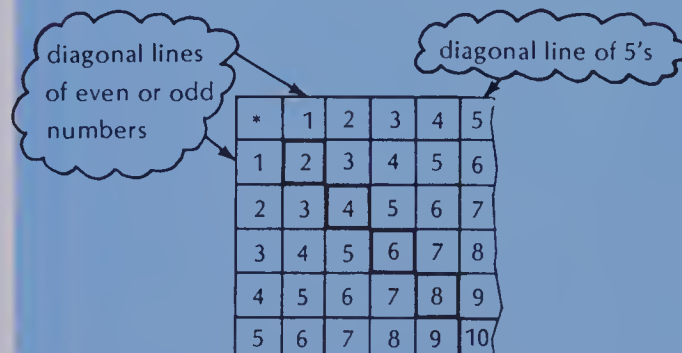
1. The game "Concentration" can be used to provide basic fact practice. Make a set of 36 cards—18 with addition and subtraction facts to 18 and 18 with the matching answers. The cards are shuffled and placed face down in a  $6 \times 6$  square. Two students or teams may play. The first player turns two cards face up. If the cards are question and answer, the player keeps them and turns two more cards face up. If the cards do not match, they are turned face down and the second player takes a turn. The player or team that can claim the most pairs wins.

2. Students may enjoy writing poems or nonsense verses that include basic facts in a pattern. For example:

Jane and Johnny went to school,  
Four blocks north was the first rule,  
Then seven east; that's a lot.  
How far did the children walk?

## Enrichment

The Pattern Puzzle encourages students to examine and explore sets of numbers in order to recognize mathematical relationships. The clouds give clues to some of the patterns which can be found in the table, but there are many others (count by ones from 0 to 9, and from 9 to 0, and from 9 to 18; sets of even numbers; sets of odd numbers; and so on).



## Extra Practice

Add or subtract.

1.  $\begin{array}{r} 9 \\ +9 \\ \hline 18 \end{array}$
2.  $\begin{array}{r} 8 \\ +7 \\ \hline 15 \end{array}$
3.  $\begin{array}{r} 15 \\ -9 \\ \hline 6 \end{array}$
4.  $\begin{array}{r} 14 \\ -6 \\ \hline 8 \end{array}$
5.  $\begin{array}{r} 8 \\ +8 \\ \hline 16 \end{array}$
6.  $\begin{array}{r} 7 \\ +5 \\ \hline 12 \end{array}$
7.  $\begin{array}{r} 16 \\ -7 \\ \hline 9 \end{array}$
8.  $\begin{array}{r} 13 \\ -6 \\ \hline 7 \end{array}$
9.  $\begin{array}{r} 6 \\ +5 \\ \hline 11 \end{array}$
10.  $\begin{array}{r} 15 \\ -7 \\ \hline 8 \end{array}$
11.  $5 + 8 = 13$
12.  $17 - 8 = 9$
13.  $15 - 9 = 6$
14.  $18 - 9 = 9$

Solve.

15. Sharon took 15¢ to school to spend at the penny carnival. She spent 6¢ at the dart throw game. How much money does she have left? **9¢**

## Worksheet A2

Pages 24-25

# UNIT 2 LESSON 3

## Objective A3

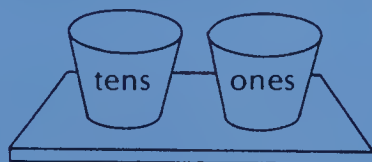
Add two-digit numbers without regrouping.

## Introducing the Lesson

Review the basic addition facts to 18 using an oral drill. Encourage the students to improve their speed of response by repeating questions. Discuss the process of adding the *ones*, then the *tens*. Remind the students that the ones should be added before the tens.

## Teaching the Lesson

Make a place-value holder from paper cups and a block of wood. Use thumb tacks to anchor the cups to the board.



Write on the chalkboard:  $34 + 62 = \underline{\quad}$ . Have a student model the number 34 by putting 3 sticks in the tens cup and 4 counters in the ones cup. Ask what value each stick represents and what value each counter represents. Repeat this process for modelling the number 62. Ask the students for the sum of 34 and 62. Count the items in the ones cup first; then those in the tens cup. Discuss the activity as the addition of two 2-digit numbers.

tens	ones
6	2
+ 3	4
9	6

## Two-Place Addition

How many stamps are there altogether?

There are  $34 + 62$  stamps.

Write the question.

$$\begin{array}{r} 34 \\ + 62 \\ \hline \end{array}$$

Add ones.

$$\begin{array}{r} 34 \\ + 62 \\ \hline 6 \end{array}$$

Add tens.

$$\begin{array}{r} 34 \\ + 62 \\ \hline 96 \end{array}$$

$$\begin{array}{r} 34 \\ + 62 \\ \hline 96 \end{array}$$

There are 96 stamps.

## EXERCISES

Add.

1. $\begin{array}{r} 43 \\ + 5 \\ \hline 48 \end{array}$	2. $\begin{array}{r} 52 \\ + 6 \\ \hline 58 \end{array}$	3. $\begin{array}{r} 27 \\ + 1 \\ \hline 28 \end{array}$	4. $\begin{array}{r} 17 \\ + 62 \\ \hline 79 \end{array}$	5. $\begin{array}{r} 2 \\ + 27 \\ \hline 29 \end{array}$
6. $\begin{array}{r} 13 \\ + 12 \\ \hline 25 \end{array}$	7. $\begin{array}{r} 17 \\ + 11 \\ \hline 28 \end{array}$	8. $\begin{array}{r} 16 \\ + 10 \\ \hline 26 \end{array}$	9. $\begin{array}{r} 13 \\ + 15 \\ \hline 28 \end{array}$	10. $\begin{array}{r} 10 \\ + 10 \\ \hline 20 \end{array}$
11. $\begin{array}{r} 42 \\ + 15 \\ \hline 57 \end{array}$	12. $\begin{array}{r} 63 \\ + 36 \\ \hline 99 \end{array}$	13. $\begin{array}{r} 31 \\ + 45 \\ \hline 76 \end{array}$	14. $\begin{array}{r} 76 \\ + 22 \\ \hline 98 \end{array}$	15. $\begin{array}{r} 50 \\ + 39 \\ \hline 89 \end{array}$
16. $\begin{array}{r} 73 \\ + 14 \\ \hline 87 \end{array}$	17. $\begin{array}{r} 80 \\ + 10 \\ \hline 90 \end{array}$	18. $\begin{array}{r} 27 \\ + 52 \\ \hline 79 \end{array}$	19. $\begin{array}{r} 48 \\ + 10 \\ \hline 58 \end{array}$	20. $\begin{array}{r} 42 \\ + 23 \\ \hline 65 \end{array}$
21. $\begin{array}{r} 48 \\ + 11 \\ \hline 59 \end{array}$	22. $\begin{array}{r} 65 \\ + 34 \\ \hline 99 \end{array}$	23. $\begin{array}{r} 22 \\ + 47 \\ \hline 69 \end{array}$	24. $\begin{array}{r} 54 \\ + 32 \\ \hline 86 \end{array}$	25. $\begin{array}{r} 26 \\ + 51 \\ \hline 77 \end{array}$
26. $\begin{array}{r} 36 \\ + 42 \\ \hline 78 \end{array}$	27. $\begin{array}{r} 28 \\ + 30 \\ \hline 58 \end{array}$	28. $\begin{array}{r} 43 \\ + 25 \\ \hline 68 \end{array}$	29. $\begin{array}{r} 55 \\ + 44 \\ \hline 99 \end{array}$	30. $\begin{array}{r} 31 \\ + 58 \\ \hline 89 \end{array}$

26

## Using the Exercises

- Students should have no trouble with these questions. The main objective is to practise copying vertical additions with the digits properly aligned.
- More advanced classes need not do all the questions, or may do them orally.



## PRACTICE

Add.

1.  $\begin{array}{r} 33 \\ + 21 \\ \hline 54 \end{array}$
2.  $\begin{array}{r} 40 \\ + 27 \\ \hline 67 \end{array}$
3.  $\begin{array}{r} 62 \\ + 31 \\ \hline 93 \end{array}$
4.  $\begin{array}{r} 24 \\ + 53 \\ \hline 77 \end{array}$
5.  $\begin{array}{r} 24 \\ + 73 \\ \hline 97 \end{array}$
6.  $\begin{array}{r} 70 \\ + 29 \\ \hline 99 \end{array}$
7.  $\begin{array}{r} 16 \\ + 82 \\ \hline 98 \end{array}$
8.  $\begin{array}{r} 74 \\ + 15 \\ \hline 89 \end{array}$
9.  $\begin{array}{r} 21 \\ + 4 \\ \hline 25 \end{array}$
10.  $\begin{array}{r} 30 \\ + 40 \\ \hline 70 \end{array}$
11.  $\begin{array}{r} 31 \\ + 18 \\ \hline 49 \end{array}$
12.  $\begin{array}{r} 59 \\ + 20 \\ \hline 79 \end{array}$
13.  $\begin{array}{r} 6 \\ + 82 \\ \hline 88 \end{array}$
14.  $\begin{array}{r} 43 \\ + 43 \\ \hline 86 \end{array}$
15.  $\begin{array}{r} 69 \\ + 30 \\ \hline 99 \end{array}$

Solve.

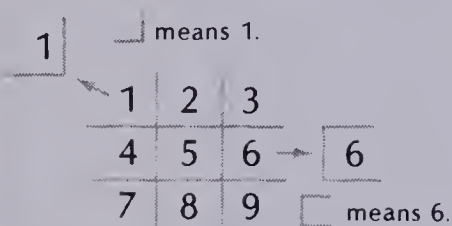
16. 
17. 

How much do these stamps cost? **29¢**

How much do these stamps cost? **46¢**

18. Rosa went to the post office to mail a birthday present to her grandmother. The parcel needed a 25 cent stamp and a 12 cent stamp. How much did it cost to mail the parcel? **37¢**
19. Emma sold 52 Canadian stamps and 36 American stamps. How many stamps did Emma sell? **88**

## Top Secret



Add.

1.  $\begin{array}{r} \square\square \\ + \square \\ \hline \square\square \end{array}$  **16**
2.  $\begin{array}{r} \square\square \\ + \square \\ \hline \square\square \end{array}$  **23**
3.  $\begin{array}{r} \square\square \\ + \square \\ \hline \square\square \end{array}$  **51**
4.  $\begin{array}{r} \square\square \\ + \square \\ \hline \square\square \end{array}$  **84**

## Extra Practice

Add.

1.  $\begin{array}{r} 44 \\ + 14 \\ \hline 58 \end{array}$
2.  $\begin{array}{r} 63 \\ + 32 \\ \hline 95 \end{array}$
3.  $\begin{array}{r} 17 \\ + 81 \\ \hline 98 \end{array}$
4.  $\begin{array}{r} 52 \\ + 35 \\ \hline 87 \end{array}$
5.  $\begin{array}{r} 23 \\ + 36 \\ \hline 59 \end{array}$
6.  $\begin{array}{r} 41 \\ + 28 \\ \hline 69 \end{array}$
7.  $\begin{array}{r} 60 \\ + 25 \\ \hline 85 \end{array}$
8.  $\begin{array}{r} 44 \\ + 42 \\ \hline 86 \end{array}$
9.  $\begin{array}{r} 45 \\ + 21 \\ \hline 66 \end{array}$
10.  $\begin{array}{r} 67 \\ + 30 \\ \hline 97 \end{array}$
11.  $\begin{array}{r} 23 \\ + 54 \\ \hline 77 \end{array}$
12.  $\begin{array}{r} 16 \\ + 32 \\ \hline 48 \end{array}$

Solve.

13. A mathematics test was in two parts. Jan scored 22 on Part A and 26 on Part B. What was her score for the whole test? **48**

## Worksheet A3

Pages 26-27

## Assigning the Practice

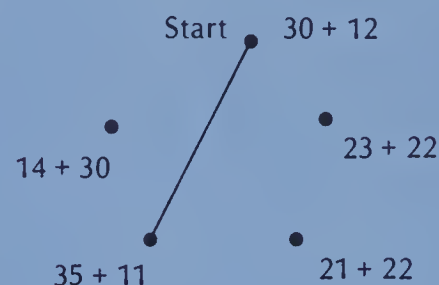
Minimum: 1-10; 18-19

Average: 6-19

Enriched: 11-19

## Reinforcement

Distribute copies of this puzzle.



Find the sum at the starting number. (42) Join that dot to the dot of the number whose sum is one larger. Repeat this procedure four more times. What figure have you drawn?

## Enrichment

1. The *Top Secret* questions use the skills learned thus far. Students may write the answers using the usual digits or the symbols used here. These figures represent a mathematical system that is different from the one the students are accustomed to using.

2. Let the pupils design or invent their own codes. Have them write three or four questions to be answered using the codes. (Having letters of the alphabet stand for numerals is a common device.)

3. In the puzzle below, the student is asked to find two squares with a common side whose sum is an even number. Now ask the students to list as many such pairs as they can find.

7	6	83	3
61	52	5	44
9	1	21	4
40	33	8	10

4. Some students may enjoy researching the historical origin of the numerals we use today. Reasonable accounts are found in several encyclopedias and children's books.

# UNIT 2 LESSON 4

## Objective A4

Add a two-digit and a one-digit number with regrouping.

## Introducing the Lesson

Using pennies and dimes, say:

1. "I have 6 pennies and 8 pennies.

That is 14 pennies or 14¢. It is awkward to carry around 14 pennies.

What would be easier to carry?"

1 dime and 4 pennies. "I should trade 10 pennies for 1 dime."

dimes	pennies	dimes	pennies
	6		6
+	8	+	8
	14	1	4

2. "I have 3 dimes and 16 pennies. It is an inconvenient group of coins.

What would be simpler, using dimes and pennies?"

dimes	pennies
3	16
4	6

4 dimes and 6 pennies. "I should trade 10 pennies for 1 dime."

## Teaching the Lesson

Use the place-value holder to set up the example in the text (45 + 8). Ask the students, "I have 13 sticks in the ones holder; what is another way to show 13 ones?"

Show the students how to make trades.

Add the ones:

tens	ones
4	3
+	9
	12

Trade:

12 ones for  
1 ten and 2 ones

Add the tens:

tens	ones
1	3
4	3
+	9
5	2

Have several students do other similar examples on the chalkboard.

## An Extra Ten

Last year, the stamp catalog listed 45¢ as the value of this Canadian stamp.

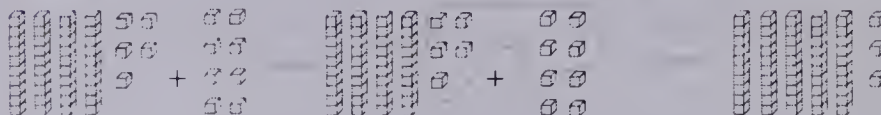
This year, the price increased by 8¢.

What would a dealer charge now?



Write the question      Add ones.      Write: 1 ten above      Add tens.  
3 ones below

Think			
45	8	1	1
+	+	45	45
8	5	+	+
		8	8
	13 = 1 ten 3 ones	3	53



The stamp now costs 53¢

## EXERCISES

Add.

1. 6	2. 16	3. 26	4. 36	5. 46
+ 8	+ 8	+ 8	+ 8	+ 8
14	24	34	44	54
6. 9	7. 19	8. 29	9. 9	10. 9
+ 3	+ 3	+ 3	+ 13	+ 23
12	22	32	22	32
11. 7	12. 17	13. 57	14. 87	15. 7
+ 7	+ 7	+ 7	+ 7	+ 37
14	24	64	94	44

28

## Using the Exercises

- Do questions 1 to 5 using the place-value holder.
- Do questions 6 to 10 orally.
- Questions 11 to 15 stress the algorithm. If students have trouble with the algorithm, they should continue to use the place-value holder.
- The questions are patterned from easy to more difficult, using the same ones digits in each row.

## PRACTICE

Add.

1.  $\begin{array}{r} 27 \\ + 8 \\ \hline 35 \end{array}$
2.  $\begin{array}{r} 32 \\ + 9 \\ \hline 41 \end{array}$
3.  $\begin{array}{r} 48 \\ + 2 \\ \hline 50 \end{array}$
4.  $\begin{array}{r} 69 \\ + 5 \\ \hline 74 \end{array}$
5.  $\begin{array}{r} 88 \\ + 8 \\ \hline 96 \end{array}$
6.  $\begin{array}{r} 75 \\ + 6 \\ \hline 81 \end{array}$
7.  $\begin{array}{r} 66 \\ + 7 \\ \hline 73 \end{array}$
8.  $\begin{array}{r} 8 \\ + 35 \\ \hline 43 \end{array}$
9.  $\begin{array}{r} 29 \\ + 3 \\ \hline 32 \end{array}$
10.  $\begin{array}{r} 48 \\ + 6 \\ \hline 54 \end{array}$
11.  $28 + 7 = 35$
12.  $9 + 33 = 42$
13.  $16 + 7 = 23$
14.  $7 + 84 = 91$
15.  $36 + 9 = 45$
16.  $3 + 29 = 32$
17.  $87 + 7 = 94$
18.  $4 + 19 = 23$

Solve.

19. Suzanne bought six new United States stamps for her collection. She already had 35 U.S. stamps. How many United States stamps does she now have? **41**

## REVIEW

Add

- |    |  |  |  |   |   |
|----|--|--|--|---|---|
| A1 | 1. $\begin{array}{r} 7 \\ + 6 \\ \hline 13 \end{array}$    | 2. $\begin{array}{r} 2 \\ + 9 \\ \hline 11 \end{array}$    | 3. $\begin{array}{r} 5 \\ + 7 \\ \hline 12 \end{array}$    | 4. $\begin{array}{r} 8 \\ + 5 \\ \hline 13 \end{array}$   | 5. $\begin{array}{r} 6 \\ + 4 \\ \hline 10 \end{array}$   |
| A2 | 6. $\begin{array}{r} 9 \\ + 9 \\ \hline 18 \end{array}$    | 7. $\begin{array}{r} 8 \\ + 6 \\ \hline 14 \end{array}$    | 8. $\begin{array}{r} 7 \\ + 9 \\ \hline 16 \end{array}$    | 9. $\begin{array}{r} 9 \\ + 6 \\ \hline 15 \end{array}$   | 10. $\begin{array}{r} 8 \\ + 9 \\ \hline 17 \end{array}$  |
| A3 | 11. $\begin{array}{r} 63 \\ + 15 \\ \hline 78 \end{array}$ | 12. $\begin{array}{r} 25 \\ + 34 \\ \hline 59 \end{array}$ | 13. $\begin{array}{r} 52 \\ + 43 \\ \hline 95 \end{array}$ | 14. $\begin{array}{r} 81 \\ + 7 \\ \hline 88 \end{array}$ | 15. $\begin{array}{r} 6 \\ + 32 \\ \hline 38 \end{array}$ |
| A4 | 16. $\begin{array}{r} 33 \\ + 8 \\ \hline 41 \end{array}$  | 17. $\begin{array}{r} 67 \\ + 3 \\ \hline 70 \end{array}$  | 18. $\begin{array}{r} 54 \\ + 9 \\ \hline 63 \end{array}$  | 19. $\begin{array}{r} 18 \\ + 7 \\ \hline 25 \end{array}$ | 20. $\begin{array}{r} 6 \\ + 48 \\ \hline 54 \end{array}$ |

29

## Assigning the Practice

Minimum: Even numbers

Average: 1-19

Enriched: 6-19

## Review Exercises

Questions	Objective	Pages
1-5	A1	22-23
6-10	A2	24-25
11-15	A3	26-27
16-20	A4	28-29

## Reinforcement

1. Have the students practise these extensions.

a. if  $9 + 3 = 12$

$19 + 3 = 22$

$29 + 3 = 32$

.

.

$89 + 3 = 92$

b. if  $7 + 7 = 14$

$17 + 7 = 24$

$27 + 7 = 34$

.

.

Now drill these extensions orally.

2. Enlarge the game of "Concentration" from 10 to 19. Make 10 cards with numbers.

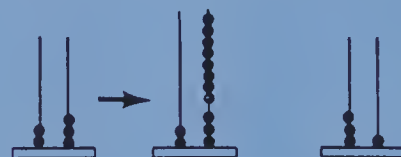
18

Make 10 cards with the expanded form in words.

1 ten 8 ones

## Enrichment

1. Have the students make an abacus out of pipe cleaners, washers, and a styrofoam board. They can use the abacus to illustrate the addition of 1- and 2-digit numbers.



$23 + 8 = 31$

2. Give students a library research project on early counting devices such as the abacus, soroban, Napier's bones, and so on.

## Extra Practice

## Worksheet A4

Pages 28-29

Add.

1.  $\begin{array}{r} 54 \\ + 6 \\ \hline 60 \end{array}$
2.  $\begin{array}{r} 5 \\ + 76 \\ \hline 81 \end{array}$
3.  $\begin{array}{r} 64 \\ + 7 \\ \hline 71 \end{array}$
4.  $\begin{array}{r} 5 \\ + 27 \\ \hline 32 \end{array}$
5.  $\begin{array}{r} 35 \\ + 5 \\ \hline 40 \end{array}$
6.  $\begin{array}{r} 89 \\ + 9 \\ \hline 98 \end{array}$
7.  $\begin{array}{r} 78 \\ + 6 \\ \hline 84 \end{array}$
8.  $\begin{array}{r} 2 \\ + 39 \\ \hline 41 \end{array}$
9.  $\begin{array}{r} 42 \\ + 9 \\ \hline 51 \end{array}$
10.  $\begin{array}{r} 38 \\ + 3 \\ \hline 41 \end{array}$
11.  $\begin{array}{r} 59 \\ + 4 \\ \hline 63 \end{array}$
12.  $\begin{array}{r} 67 \\ + 7 \\ \hline 74 \end{array}$

Solve.

13. The school newspaper went on sale at noon on Monday. During the lunch hour 15 copies were sold. After school 6 more copies were sold. How many copies were sold that day? **21**





## PRACTICE

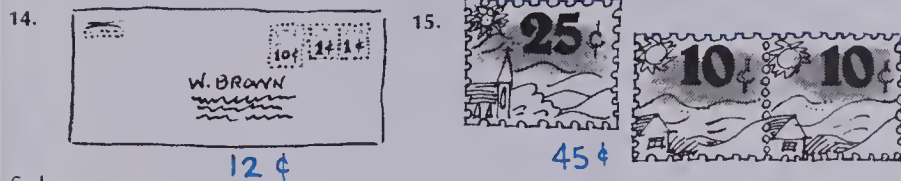
Find the sum.

1. $\begin{array}{r} 6 \\ 4 \\ +5 \\ \hline 15 \end{array}$	2. $\begin{array}{r} 2 \\ 4 \\ +6 \\ \hline 12 \end{array}$	3. $\begin{array}{r} 9 \\ 1 \\ +8 \\ \hline 18 \end{array}$	4. $\begin{array}{r} 9 \\ 7 \\ +7 \\ \hline 23 \end{array}$	5. $\begin{array}{r} 8 \\ 4 \\ +9 \\ \hline 21 \end{array}$
---	---	---	---	---

6.  $2 + 4 + 9 = 15$       7.  $3 + 0 + 4 = 7$       8.  $9 + 5 + 8 = 22$

9. $\begin{array}{r} 50 \\ 20 \\ +20 \\ \hline 90 \end{array}$	10. $\begin{array}{r} 13 \\ 13 \\ +13 \\ \hline 39 \end{array}$	11. $\begin{array}{r} 32 \\ 15 \\ +41 \\ \hline 88 \end{array}$	12. $\begin{array}{r} 44 \\ 11 \\ +23 \\ \hline 78 \end{array}$	13. $\begin{array}{r} 17 \\ 30 \\ +42 \\ \hline 89 \end{array}$
--	---	---	---	---

Find the value of each set of stamps.



Solve.

16. A page of a stamp album has a set of 5 stamps and a set of 8 on it. There are 7 spaces left. How many stamps can be put on the page? **20**

## Lazy Head!

You can add numbers in any order.

Find 2 numbers whose sum is 10.

Add these first.

Then add the other number.

$\begin{array}{r} 5 \\ 3 \\ +5 \\ \hline 10 \end{array}$	$\begin{array}{r} 10 \\ +3 \\ \hline 13 \end{array}$	$\begin{array}{r} 5 \\ 3 \\ +5 \\ \hline 13 \end{array}$
--	--	--

Try these.

1. $\begin{array}{r} 5 \\ 8 \\ +2 \\ \hline 15 \end{array}$	2. $\begin{array}{r} 4 \\ 8 \\ +6 \\ \hline 18 \end{array}$	3. $\begin{array}{r} 5 \\ 5 \\ +7 \\ \hline 17 \end{array}$	4. $\begin{array}{r} 7 \\ 9 \\ +3 \\ \hline 19 \end{array}$	5. $\begin{array}{r} 6 \\ 1 \\ +9 \\ \hline 16 \end{array}$
---	---	---	---	---

31

## Assigning the Practice

Minimum: 1-5, 9-16

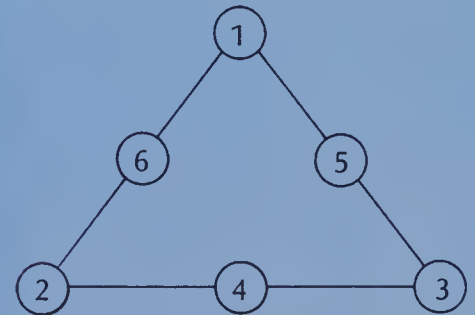
Average: 6-16

Enriched: 9-16

## Reinforcement

1. Assign *Lazy Head*: the associative and commutative properties in action. Students should realize that the sum is the same, no matter what the order of the addends. They need not refer to the properties by name.

2. The students can make a "magic" triangle. Have them place each of the numbers, 1, 2, 3, 4, 5, and 6 in a triangle in such a way that the sum of the numbers on each side is 9.



3. Have the students place the same numbers in the triangle so that the sum on each side is 12.

## Enrichment

Have students investigate the number of ways in which 4 addends can be rearranged by using a diagram. For example, a rearrangement for adding  $1 + 2 + 3 + 4$  is shown below.

1	←	2
3	→	4

$3 + 2 + 1 + 4$

## Extra Practice

Add.

1.  $1 + 4 + 9 = 14$       2.  $3 + 5 + 7 = 15$

3.  $4 + 6 + 8 = 18$       4.  $6 + 6 + 6 = 18$

5. $\begin{array}{r} 24 \\ 33 \\ +11 \\ \hline 68 \end{array}$	6. $\begin{array}{r} 16 \\ 50 \\ +32 \\ \hline 98 \end{array}$	7. $\begin{array}{r} 30 \\ 40 \\ +20 \\ \hline 90 \end{array}$	8. $\begin{array}{r} 32 \\ 32 \\ +32 \\ \hline 96 \end{array}$
9. $\begin{array}{r} 25 \\ 2 \\ +31 \\ \hline 58 \end{array}$	10. $\begin{array}{r} 6 \\ 32 \\ +51 \\ \hline 89 \end{array}$	11. $\begin{array}{r} 43 \\ 11 \\ +5 \\ \hline 59 \end{array}$	12. $\begin{array}{r} 9 \\ 9 \\ +1 \\ \hline 19 \end{array}$

## Worksheet A5

Pages 30-31

# UNIT 2 LESSON 6

## Objective A6

Subtract two-digit numbers without regrouping.

### Introducing the Lesson

Tell the story of a boy who went to the store with 48¢ to buy a chocolate bar worth 37¢, but who wasn't sure how much change he should get. Write the numbers on the board. Ask which operation (addition or subtraction) they would use. Ask the students how much change he should get.

tens	ones
4	8
—3	7
1	1

11¢ change

### Teaching the Lesson

Use the place-value holder described in Unit 1, Lesson 3, (page 6). Have one pupil model the number 98 using sticks and counters. Then write the number on the chalkboard. Have another student remove 47 from the place-value holder. Write this number on the board beneath the 98. Have a third student find how many sticks and counters are left. Write this number under the 47. Ask the students to name the operation they use to solve the problem. Point out the similarities between addition and subtraction of 2-digit numbers.

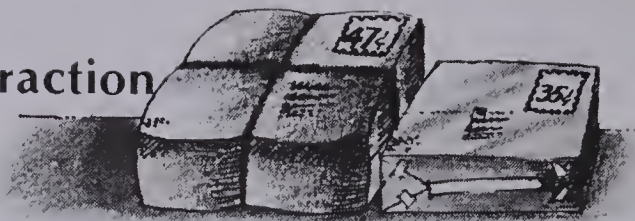
tens	ones
9	8
—4	7
5	1

51 are left.

Work through the example in the textbook without the aid of a place-value chart.

## Two-Place Subtraction

How much more does it cost to mail the large parcel?



Write the question.

$$\begin{array}{r} 47 \\ - 35 \\ \hline \end{array}$$

Subtract ones.

$$\begin{array}{r} 47 \\ - 35 \\ \hline 2 \end{array}$$

Subtract tens.

$$\begin{array}{r} 47 \\ - 35 \\ \hline 12 \end{array}$$

$$\begin{array}{r} 47 \\ - 35 \\ \hline 12 \end{array}$$

The larger parcel costs 12¢ more to mail.

### EXERCISES

Subtract.

1. $\begin{array}{r} 35 \\ - 12 \\ \hline 23 \end{array}$	2. $\begin{array}{r} 87 \\ - 34 \\ \hline 53 \end{array}$	3. $\begin{array}{r} 96 \\ - 52 \\ \hline 44 \end{array}$	4. $\begin{array}{r} 48 \\ - 43 \\ \hline 5 \end{array}$	5. $\begin{array}{r} 79 \\ - 28 \\ \hline 51 \end{array}$
6. $\begin{array}{r} 67 \\ - 16 \\ \hline 51 \end{array}$	7. $\begin{array}{r} 59 \\ - 36 \\ \hline 23 \end{array}$	8. $\begin{array}{r} 52 \\ - 11 \\ \hline 41 \end{array}$	9. $\begin{array}{r} 16 \\ - 14 \\ \hline 2 \end{array}$	10. $\begin{array}{r} 80 \\ - 50 \\ \hline 30 \end{array}$
11. $\begin{array}{r} 56 \\ - 15 \\ \hline 41 \end{array}$	12. $\begin{array}{r} 76 \\ - 30 \\ \hline 46 \end{array}$	13. $\begin{array}{r} 83 \\ - 72 \\ \hline 11 \end{array}$	14. $\begin{array}{r} 97 \\ - 4 \\ \hline 93 \end{array}$	15. $\begin{array}{r} 38 \\ - 31 \\ \hline 7 \end{array}$
16. $\begin{array}{r} 40 \\ - 10 \\ \hline 30 \end{array}$	17. $\begin{array}{r} 29 \\ - 23 \\ \hline 6 \end{array}$	18. $\begin{array}{r} 31 \\ - 21 \\ \hline 10 \end{array}$	19. $\begin{array}{r} 94 \\ - 33 \\ \hline 61 \end{array}$	20. $\begin{array}{r} 44 \\ - 14 \\ \hline 30 \end{array}$
21. $\begin{array}{r} 75 \\ - 42 \\ \hline 33 \end{array}$	22. $\begin{array}{r} 87 \\ - 32 \\ \hline 55 \end{array}$	23. $\begin{array}{r} 92 \\ - 41 \\ \hline 51 \end{array}$	24. $\begin{array}{r} 84 \\ - 82 \\ \hline 2 \end{array}$	25. $\begin{array}{r} 63 \\ - 20 \\ \hline 43 \end{array}$
26. $\begin{array}{r} 39 \\ - 3 \\ \hline 36 \end{array}$	27. $\begin{array}{r} 45 \\ - 3 \\ \hline 42 \end{array}$	28. $\begin{array}{r} 99 \\ - 9 \\ \hline 90 \end{array}$	29. $\begin{array}{r} 69 \\ - 2 \\ \hline 67 \end{array}$	30. $\begin{array}{r} 38 \\ - 7 \\ \hline 31 \end{array}$

32

### Using the Exercises

- Be sure the students are getting the digits properly aligned when copying the questions. This is especially important in questions 26 to 30 to ensure the ones digit is subtracted correctly.
- Many classes will not need to do all the questions. You may wish to use this as an oral exercise.



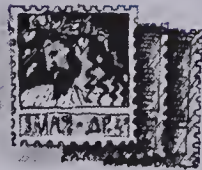
## PRACTICE

Subtract.

- |   |  |   |   |   |
|---|--|---|---|---|
| 1. $\begin{array}{r} 85 \\ -42 \\ \hline 43 \end{array}$  | 2. $\begin{array}{r} 56 \\ -13 \\ \hline 43 \end{array}$ | 3. $\begin{array}{r} 38 \\ -6 \\ \hline 32 \end{array}$   | 4. $\begin{array}{r} 97 \\ -21 \\ \hline 76 \end{array}$  | 5. $\begin{array}{r} 22 \\ -12 \\ \hline 10 \end{array}$  |
| 6. $\begin{array}{r} 98 \\ -70 \\ \hline 28 \end{array}$  | 7. $\begin{array}{r} 41 \\ -20 \\ \hline 21 \end{array}$ | 8. $\begin{array}{r} 59 \\ -36 \\ \hline 23 \end{array}$  | 9. $\begin{array}{r} 75 \\ -4 \\ \hline 71 \end{array}$   | 10. $\begin{array}{r} 63 \\ -33 \\ \hline 30 \end{array}$ |
| 11. $\begin{array}{r} 74 \\ -53 \\ \hline 21 \end{array}$ | 12. $\begin{array}{r} 19 \\ -17 \\ \hline 2 \end{array}$ | 13. $\begin{array}{r} 52 \\ -40 \\ \hline 12 \end{array}$ | 14. $\begin{array}{r} 96 \\ -34 \\ \hline 62 \end{array}$ | 15. $\begin{array}{r} 87 \\ -7 \\ \hline 80 \end{array}$  |

Solve.

16. 29 Italian and Greek stamps  
15 Greek stamps **14**  
How many Italian stamps?
17. 75¢ to clerk  
51¢ for stamps  
How much change? **24¢**
18. David bought a stamp package containing 75 stamps. There were 45 Canadian stamps in the package. How many foreign stamps did David get? **30**



## Sign Language

Copy the grid.

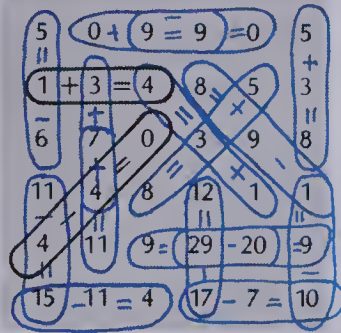
Look for addition and subtraction facts on it.

Put a plus or minus sign and an equal sign between numbers.

How many true statements can you make?

The facts can be found in diagonals, rows, or columns.

You can use numbers more than once.



33

## Assigning the Practice

Minimum: 1-5, 16-18

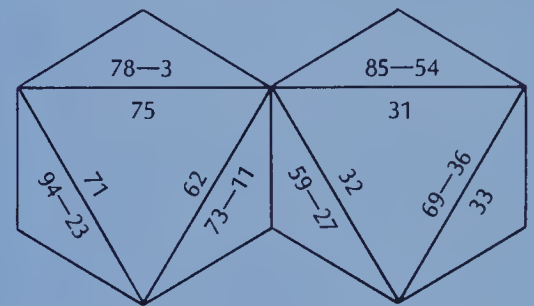
Average: 6-10, 16-18

Enriched: 11-18

## Reinforcement

1. Extend the Bingo game from the Reinforcement activity in Lesson 2 of this Unit to the facts to 18. Make an assortment of cards for players with the facts to 18 and a set of subtraction questions for the caller. Be sure no regrouping is required.

2. Students can make their own subtraction sentence puzzles. Direct them to begin with a geometric figure made from heavy paper. They next divide it into parts and write subtraction sentences on one part with the answers on the adjoining part. The puzzle is cut into pieces. It can be assembled by matching questions and answers.



3. Enlarge the "Concentration" game, page 25, using the subtraction facts to 18 and the answers.

18 - 9

9

## Extra Practice

Subtract.

- |  |   |  |   |
|--|---|--|---|
| 1. $\begin{array}{r} 59 \\ -23 \\ \hline 36 \end{array}$ | 2. $\begin{array}{r} 84 \\ -31 \\ \hline 53 \end{array}$  | 3. $\begin{array}{r} 35 \\ -15 \\ \hline 20 \end{array}$ | 4. $\begin{array}{r} 46 \\ -24 \\ \hline 22 \end{array}$  |
| 5. $\begin{array}{r} 87 \\ -36 \\ \hline 51 \end{array}$ | 6. $\begin{array}{r} 25 \\ -14 \\ \hline 11 \end{array}$  | 7. $\begin{array}{r} 63 \\ -52 \\ \hline 11 \end{array}$ | 8. $\begin{array}{r} 98 \\ -91 \\ \hline 7 \end{array}$   |
| 9. $\begin{array}{r} 38 \\ -16 \\ \hline 22 \end{array}$ | 10. $\begin{array}{r} 55 \\ -33 \\ \hline 22 \end{array}$ | 11. $\begin{array}{r} 29 \\ -20 \\ \hline 9 \end{array}$ | 12. $\begin{array}{r} 34 \\ -14 \\ \hline 20 \end{array}$ |

Solve.

13. Some of the students from Viceroy School went on a bus trip. The bus had seats for 49 people. There were 35 children and 2 teachers going on the bus trip. How many empty seats were there? **12**

## Worksheet A6

Pages 32-33

## Enrichment

The *Sign Language* activity will give the students practice in recognizing number relationships. It is more difficult than problems stated in the usual way, but all students should be able to find some of the facts.

# UNIT 2 LESSON 7

## Objective A7

Subtract a one-digit number from a two-digit number with regrouping.

## Introducing the Lesson

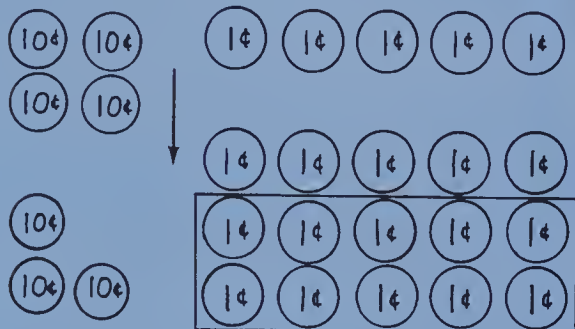
Tell another story of buying things in a store. Janice had 45¢. She went to the store and spent 9¢ on candy. How much does she have left? Ask the students what they must do to find the answer.

## Teaching the Lesson

This is a very important lesson. The students should already have a good background in **regrouping** from Grade 3. If you discover that some have not learned regrouping adequately, some extra work with place value may be needed before they go on to the subtraction in Unit 3.

dimes	pennies
4	5
—	9

Point out that we subtract the pennies (or ones) *first*. Since we cannot do  $5 - 9$ , we must **regroup**. Show the regrouping with coins before you record it on the chalkboard.



dimes	pennies
3	15
<del>4</del>	<del>5</del>
—	9
	6

Now subtract the ones. Subtract the tens:

dimes	pennies
3	15
<del>4</del>	<del>5</del>
—	9
	6

dimes	pennies
3	15
<del>4</del>	<del>5</del>
—	9
3	6

Discuss the example at the top of page 34 and show other examples of regrouping.

## Two-Place Subtraction

How much more does the blue stamp cost?



Write the question.

$$\begin{array}{r} 25 \\ - 8 \\ \hline \end{array}$$

Regroup tens and ones.

$$\begin{array}{r} 1\ 15 \\ \cancel{2}\ \cancel{5} \\ - 8 \\ \hline \end{array}$$

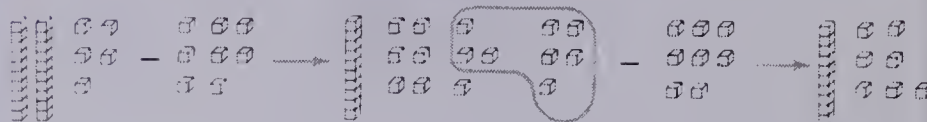
Subtract ones.

$$\begin{array}{r} 1\ 15 \\ \cancel{2}\ \cancel{5} \\ - 8 \\ \hline 7 \end{array}$$

Subtract tens.

$$\begin{array}{r} 1\ 15 \\ \cancel{1}\ \cancel{15} \\ - 8 \\ \hline 17 \end{array}$$

$$\begin{array}{r} 1\ 15 \\ \cancel{2}\ \cancel{5} \\ - 8 \\ \hline 17 \end{array}$$



The blue stamp costs 17¢ more.

## EXERCISES

Subtract.

$$\begin{array}{r} 12 \\ - 3 \\ \hline 9 \end{array}$$

$$\begin{array}{r} 22 \\ - 3 \\ \hline 19 \end{array}$$

$$\begin{array}{r} 32 \\ - 3 \\ \hline 29 \end{array}$$

$$\begin{array}{r} 42 \\ - 3 \\ \hline 39 \end{array}$$

$$\begin{array}{r} 82 \\ - 3 \\ \hline 79 \end{array}$$

$$\begin{array}{r} 17 \\ - 9 \\ \hline 8 \end{array}$$

$$\begin{array}{r} 27 \\ - 9 \\ \hline 18 \end{array}$$

$$\begin{array}{r} 37 \\ - 9 \\ \hline 28 \end{array}$$

$$\begin{array}{r} 47 \\ - 9 \\ \hline 38 \end{array}$$

$$\begin{array}{r} 77 \\ - 9 \\ \hline 68 \end{array}$$

$$\begin{array}{r} 16 \\ - 8 \\ \hline 8 \end{array}$$

$$\begin{array}{r} 26 \\ - 8 \\ \hline 18 \end{array}$$

$$\begin{array}{r} 46 \\ - 8 \\ \hline 38 \end{array}$$

$$\begin{array}{r} 66 \\ - 8 \\ \hline 58 \end{array}$$

$$\begin{array}{r} 96 \\ - 8 \\ \hline 88 \end{array}$$

34

## Using the Exercises

- Each line starts with a basic fact and extends to regrouping questions that use the same ones digit. The students should see the pattern easily. Again, those having trouble should be given more practice with regrouping.

## PRACTICE

Subtract

1.  $\begin{array}{r} 85 \\ - 6 \\ \hline 79 \end{array}$
2.  $\begin{array}{r} 97 \\ - 9 \\ \hline 88 \end{array}$
3.  $\begin{array}{r} 26 \\ - 7 \\ \hline 19 \end{array}$
4.  $\begin{array}{r} 58 \\ - 9 \\ \hline 49 \end{array}$
5.  $\begin{array}{r} 62 \\ - 4 \\ \hline 58 \end{array}$
6.  $\begin{array}{r} 44 \\ - 5 \\ \hline 39 \end{array}$
7.  $\begin{array}{r} 78 \\ - 9 \\ \hline 69 \end{array}$
8.  $\begin{array}{r} 66 \\ - 8 \\ \hline 58 \end{array}$
9.  $\begin{array}{r} 37 \\ - 8 \\ \hline 29 \end{array}$
10.  $\begin{array}{r} 23 \\ - 6 \\ \hline 17 \end{array}$
11.  $\begin{array}{r} 57 \\ - 9 \\ \hline 48 \end{array}$
12.  $\begin{array}{r} 41 \\ - 3 \\ \hline 38 \end{array}$
13.  $\begin{array}{r} 35 \\ - 7 \\ \hline 28 \end{array}$
14.  $\begin{array}{r} 65 \\ - 8 \\ \hline 57 \end{array}$
15.  $\begin{array}{r} 53 \\ - 4 \\ \hline 49 \end{array}$

Solve.

16. 27 stamp club members  
8 members move  
How many members now? **19**
17. 25¢ to clerk  
9¢ for stamp  
How much change? **16¢**
18. Willie had 32 Hungarian stamps in his collection.  
He gave his brother five of them to help him start  
his own collection. How many Hungarian stamps did  
Willie have left? **27**
19. Alana had 53 British stamps in her collection.  
She traded four British stamps for some Canadian  
stamps. How many British stamps does Alana  
have now? **49**



## Magic Square

This is a magic square  
Each row, column, and diagonal  
has the same sum.

2	4	6
1	3	5
7	8	9

Help Gertie disguise the square. Put the digits  
1 through 9 in the squares so that *none* of the rows,  
columns, or diagonals has the same sum.



35

## Extra Practice

Subtract.

1.  $\begin{array}{r} 93 \\ - 8 \\ \hline 85 \end{array}$
2.  $\begin{array}{r} 42 \\ - 9 \\ \hline 33 \end{array}$
3.  $\begin{array}{r} 75 \\ - 8 \\ \hline 67 \end{array}$
4.  $\begin{array}{r} 61 \\ - 7 \\ \hline 54 \end{array}$
5.  $\begin{array}{r} 82 \\ - 6 \\ \hline 76 \end{array}$
6.  $\begin{array}{r} 30 \\ - 5 \\ \hline 25 \end{array}$
7.  $\begin{array}{r} 54 \\ - 9 \\ \hline 45 \end{array}$
8.  $\begin{array}{r} 51 \\ - 4 \\ \hline 47 \end{array}$
9.  $\begin{array}{r} 23 \\ - 4 \\ \hline 19 \end{array}$
10.  $\begin{array}{r} 67 \\ - 9 \\ \hline 58 \end{array}$
11.  $\begin{array}{r} 32 \\ - 5 \\ \hline 27 \end{array}$
12.  $\begin{array}{r} 51 \\ - 2 \\ \hline 49 \end{array}$

Solve.

13. I had 47¢.  
I spent 9¢.  
How much do I have left? **38¢**
14. Dad gave me 36¢.  
I lost 7¢.  
How much do I have now? **29¢**

## Assigning the Practice

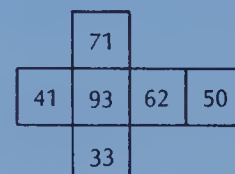
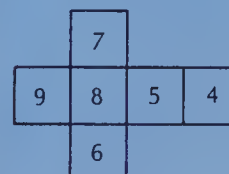
Minimum: 1-5, 16-19

Average: 6-10, 16-19

Enriched: 11-19

## Reinforcement

1. Make a pair of dice from wooden cubes or from cardboard and masking tape about 4 cm on a side. Label the sides of one: 9, 8, 7, 6, 5, 4. Label the sides of the other: 41, 93, 62, 50, 71, 33.



Two students play. One rolls the dice and subtracts the smaller number from the larger one and tells the answer to the partner. A correct answer is worth 2 points. Then the second player repeats the procedure. The first player to score 10 points is the winner.

2. Play the game described in the activity above but with the players recording the equations (the numbers rolled, with their answers) on paper.

$$93 - 6 = 87$$

Have them each do ten equations.

3. Direct the students to work in pairs using a calculator. One student holds the calculator while the second student answers the question. If the answer is correct, the players exchange roles. If wrong, they try another question.

## Enrichment

The *Magic Square* will require patience. Most children will use a random "trial and error" procedure. Encourage them to develop their own strategy.

## Worksheet A7

Pages 34-35



UNIT 2 LESSON 8

Objective A8

Add and subtract three-digit numbers without regrouping.

Introducing the Lesson

Tell a story in which two 3-digit numbers need to be added in order to finish the story. (The lesson example, page 36, about the stamp collectors' convention could be used.) Do not ask the students for the answer. Instead, ask groups of students to write other stories that require addition to complete. Have different groups of students write stories that require subtraction to complete. Have students from each group alternate reading their stories to the class. This will provide an opportunity to discuss the differences between problems that involve addition and those that involve subtraction. (The next lesson will reinforce this skill.)

Teaching the Lesson

On the chalkboard, write an addition question with two 2-digit numbers needing no regrouping.

56  
+22

Ask the students to describe the method for finding the sum. When the correct solution has been given, rewrite the question on the board, putting a hundreds digit in front of each of the numbers.

356  
+422

Ask the students how they might find the answer to this question. Repeat the above procedure with subtraction.

76                      876  
-25                      -225

Emphasize the order in which the digits are added or subtracted (*right to left, or, start with the ones*). This makes no difference here, but will be essential for the regrouping lessons in *Unit 3*. Read the problems in the textbook and work through each step of the calculations with the students.

Three-Place Addition and Subtraction

What was the total attendance at the convention?  
How many more men than women registered?

Add ones.

247  
+ 131  
8

Add tens.

247  
+ 131  
78

Add hundreds.

247  
+ 131  
378

There were 378 men and women attending the convention.

Subtract ones.

247  
- 131  
6

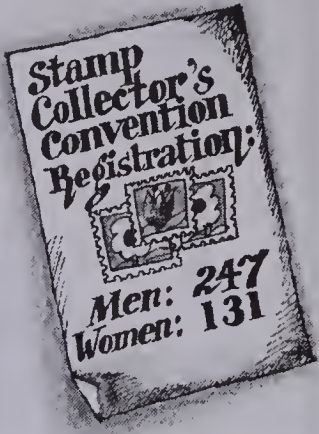
Subtract tens.

247  
- 131  
16

Subtract hundreds.

247  
- 131  
116

There were 116 more men than women registered



EXERCISES

Add or subtract

1. 813 + 146 959	2. 635 + 304 939	3. 442 + 322 764	4. 196 + 801 997	5. 750 + 240 990
6. 575 + 413 988	7. 869 + 120 989	8. 217 + 782 999	9. 300 + 500 800	10. 406 + 202 608
11. 585 - 420 165	12. 982 - 361 621	13. 726 - 503 223	14. 874 - 632 242	15. 375 - 241 134
16. 987 - 700 287	17. 305 - 102 203	18. 689 - 589 100	19. 634 - 421 213	20. 975 - 860 115

Using the Exercises

- These questions should be mastered easily considering the 2-digit work that has been done. Warn the children to watch for the transition from addition to subtraction (question 11). Remind them to *check the operation* before calculating.

## PRACTICE

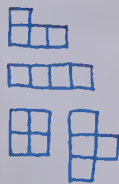
Add or subtract.

1.  $\begin{array}{r} 276 \\ + 411 \\ \hline 687 \end{array}$
2.  $\begin{array}{r} 765 \\ + 112 \\ \hline 877 \end{array}$
3.  $\begin{array}{r} 897 \\ + 101 \\ \hline 998 \end{array}$
4.  $\begin{array}{r} 431 \\ + 465 \\ \hline 896 \end{array}$
5.  $\begin{array}{r} 553 \\ + 336 \\ \hline 889 \end{array}$
6.  $\begin{array}{r} 984 \\ - 810 \\ \hline 174 \end{array}$
7.  $\begin{array}{r} 658 \\ - 337 \\ \hline 321 \end{array}$
8.  $\begin{array}{r} 513 \\ - 300 \\ \hline 213 \end{array}$
9.  $\begin{array}{r} 309 \\ - 103 \\ \hline 206 \end{array}$
10.  $\begin{array}{r} 782 \\ - 781 \\ \hline 1 \end{array}$
11.  $\begin{array}{r} 236 \\ - 115 \\ \hline 121 \end{array}$
12.  $\begin{array}{r} 428 \\ - 300 \\ \hline 128 \end{array}$
13.  $\begin{array}{r} 793 \\ - 182 \\ \hline 611 \end{array}$
14.  $\begin{array}{r} 824 \\ - 314 \\ \hline 510 \end{array}$
15.  $\begin{array}{r} 500 \\ - 100 \\ \hline 400 \end{array}$

Solve.

16. 205 stamps  
371 stamps  
How many stamps in all? **576**
17. 848 stamp collectors  
502 girls collect stamps **346**  
How many boys collect stamps?
18. John had 468 stamps. His friend Joe had 330 stamps.  
How many stamps did they have in all? **798**
19. Shauna and her sister Sherrie together had 853 stamps. Shauna had 520 stamps. How many stamps did Sherrie have? **333**

## Fancy Figures



How many different figures can you make using the four stamps? Each stamp must have one edge in common with at least one other stamp.

**4 figures**

37

## Assigning the Practice

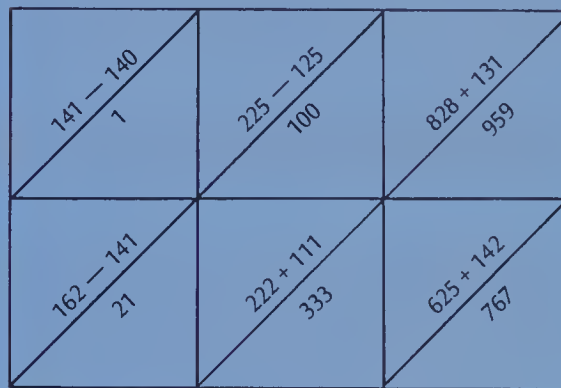
Minimum: 1-10, 16-19

Average: 1-5, 11-19

Enriched: 16-19

## Reinforcement

Cut two strips of cardboard 18 cm by 18 cm. Cut them and mark them according to the diagram below. Ask the students to assemble the pieces to make true math statements.



## Enrichment

1. To do *Fancy Figures* the students may wish to use blocks or squared paper to find other figures. Depending on the background knowledge of the class, you may decide that a figure that is a slide, flip, or turn of any other figure is not different and so cannot be used. There are three more original figures.
2. Have the pupils use 5 stamps and make as many different figures as possible according to the rules for *Fancy Figures*.
3. Give the students this missing digits challenge.

- a.  $\begin{array}{r} 82* \\ - 4*7 \\ \hline *12 \end{array}$  (9) (1) (4)
- b.  $\begin{array}{r} **6(3)(3) \\ + 132 \\ \hline 46* \end{array}$  (8)
- c.  $\begin{array}{r} 761 \\ - *** \\ \hline 561 \end{array}$  (200)
- d.  $\begin{array}{r} *** (555) \\ + 134 \\ \hline 689 \end{array}$

## Extra Practice

Add.

1.  $\begin{array}{r} 243 \\ + 421 \\ \hline 664 \end{array}$
2.  $\begin{array}{r} 156 \\ + 433 \\ \hline 589 \end{array}$
3.  $\begin{array}{r} 620 \\ + 159 \\ \hline 779 \end{array}$
4.  $\begin{array}{r} 536 \\ + 452 \\ \hline 988 \end{array}$

Subtract.

5.  $\begin{array}{r} 469 \\ - 232 \\ \hline 237 \end{array}$
6.  $\begin{array}{r} 671 \\ - 250 \\ \hline 421 \end{array}$
7.  $\begin{array}{r} 859 \\ - 432 \\ \hline 427 \end{array}$
8.  $\begin{array}{r} 365 \\ - 141 \\ \hline 224 \end{array}$

Add or subtract.

9.  $\begin{array}{r} 344 \\ - 142 \\ \hline 202 \end{array}$
10.  $\begin{array}{r} 344 \\ + 142 \\ \hline 486 \end{array}$
11.  $\begin{array}{r} 655 \\ + 140 \\ \hline 795 \end{array}$
12.  $\begin{array}{r} 821 \\ - 601 \\ \hline 220 \end{array}$

## Worksheet A8

Pages 36-37

# UNIT 2 LESSON 9

## Objective PS2

Recognize words and phrases associated with addition and subtraction problems.

## Introducing the Lesson

Discuss everyday situations where simple addition and subtraction are required; class attendance, number of boys and girls present. Try to include examples involving the buying, selling, and collecting of stamps.

## Teaching the Lesson

Use real coins to simulate the problems in the lesson example on page 38.

After working the problems through with the students, draw attention to the fact that both problems are identical except for the *wording* of the questions. Emphasize the need to know the ways of asking addition and subtraction questions.

Ask the children to think of a few different ways of asking each of the questions posed in the lesson example. Write these on the chalkboard and discuss them, focusing on the *key words* that help to indicate the operation required.

Try to avoid statements that certain key words *always* mean to add or to subtract. Instead, stress the reading and digesting of the entire word problem *before* focusing on the key words. At this stage, it is more important to solve a few problems thoroughly and correctly, than a great many poorly.

## Problem Solving

Here are two problems.



### Problem 1

Trudy has 56¢.

David has 32¢.

How much do they have altogether?

$$\begin{array}{r} \text{Add!} \quad 56\text{¢} \\ + 32\text{¢} \\ \hline 88\text{¢} \end{array}$$

They have 88¢ altogether.

### Problem 2

Trudy has 56¢.

David has 32¢.

How much more does Trudy have?

$$\begin{array}{r} \text{Subtract!} \quad 56\text{¢} \\ - 32\text{¢} \\ \hline 24\text{¢} \end{array}$$

Trudy has 24¢ more.

For some addition and subtraction problems, it helps to look for special words and phrases.

## EXERCISES

Are these addition or subtraction questions?

Which operation should you use?

- |                                  |                                       |
|----------------------------------|---------------------------------------|
| 1. How much in all? $\oplus$ —   | 2. How much is left? $+$ $\ominus$    |
| 3. What is the total? $\oplus$ — | 4. Find the difference. $+$ $\ominus$ |
| 5. How much less? $+$ $\ominus$  | 6. Find the sum. $\oplus$ —           |

Decide which operation to use.

- |  |  |
|--|--|
| 7. Tom has 47 marbles.<br>Joe has 32 marbles. $+$<br>How many do they have altogether? <b>79</b>   | 8. Marta has 34 records.<br>Sam has 30 records. $-$<br>How many more records does Marta have? <b>4</b> |
| 9. Bob has 79 stamps.<br>Gilda has 54 stamps. $-$<br>How many more stamps does Bob have? <b>25</b> | 10. Debbie has 23 stamps.<br>She bought 6 more. $+$<br>How many does she have now? <b>29</b>           |

38

## Using the Exercises

- Emphasize the correct decision as to what the operation should be, not the solving of the problem.
- Read each problem (questions 7 to 10) with the students and discuss the wording and how that helps one to decide what to do.



## PRACTICE

Decide which operation to use.

- Pam has 56 books.  $-$   
Ron has 31 books.  $25$   
How many more books does Pam have than Ron?
- Sam has 23 cards.  $+$   
Jim has 45 cards.  $68$   
How many cards do they have together?
- Maria has 26 cousins.  $-$   
Joan has 14 cousins.  $12$   
How many more cousins does Maria have than Joan?
- Chang has 64 marks.  $-$   
Jean has 78 marks.  $14$   
How many fewer marks does Chang have?
- Don has 52 models.  $+$   
Mel has 41 models.  $93$   
How many models do they have in all?
- Helen has 24 pictures.  $+$   
David has 42 pictures.  $66$   
What is the total number of pictures?

Solve.

- Tina had 41 stamps in her collection. She collected 33 more. How many stamps were in her collection then?  $74$
- Michael has 54 stamps in his collection. His brother Scott has 87 stamps in his collection. Who has more stamps? How many more does he have?  $Scott, 33 \text{ more}$

## USING THE CALCULATOR

Use a calculator to find the following sums.

- $57 + 31$   $88$   $31 + 57$
- $48 + 26$   $74$
- $308 + 421$   $729$
- $3 + 4 + 7$   $14$
- $6 + 9 + 1$   $16$

Change the order of addition.

Does changing the order of addition change the sum?

no

39

## Assigning the Practice

Minimum: 1-6

Average: 1-8

Enriched: 3-8

## Reinforcement

- Have each student make up an addition or subtraction word problem. Ask the students to read their problems, after which the rest of the class suggests alternative wordings.
- Write each word problem from the above activity on a  $20 \text{ cm} \times 20 \text{ cm}$  card and display them in the classroom for everyone to solve.

## Enrichment

- Assign *Using the Calculator*, which should bring out the conclusion that in addition an order change does not change the sum. Some students may wish to test this idea with even larger numbers. Ask them to record all additions they test.
- After having practice writing problems in the Reinforcement activity above, the students can work in a classroom centre writing out word problems. Encourage the writing of problems that develop from everyday classroom and neighbourhood events. Mount the best problems on cards for the class to solve.

## Extra Practice

## Worksheet PS2

Pages 38-39

Solve.

- Sheila had 97 on a history test and John had 75. How many points higher was Sheila's score?  $22$
- Andre bought a 30¢ can of pop at the corner store. If he gave the clerk 50¢, how much change did he get?  $20 \text{ ¢}$
- Last night the temperature was  $12^{\circ}\text{C}$ . During the day it rose  $15^{\circ}\text{C}$ . What was the daytime temperature?  $27^{\circ}\text{C}$
- Joel bought three 12¢ stamps at the post office. How much did he pay for them?  $36 \text{ ¢}$

## Problem Solving Activities

Assign Level 4, Unit 1

## UNIT 2 LESSON 10

### Objective M2

Measure temperature in degrees Celsius.

### Introducing the Lesson

Discuss everyday situations in which *temperature* provides useful information: deciding what clothes to wear, cooking and baking, knowing if a person has a fever, setting the house thermostat, setting the coldness level for refrigerators and freezers, and so on. The students should know that a thermometer is an instrument that tells us how hot something is. If they seem perplexed by the measurement of temperature, point out the basic components of the measurement process: the attribute to be measured, comparison, non-standard units, standard units, measuring instruments.

### Teaching the Lesson

Make a large drawing of a *thermometer* on heavy paper. Cut slots on either side of the column of *mercury* and insert a moveable tape to mark different temperatures. Also (or alternatively) make a worksheet showing several thermometers which the students can colour to show various temperatures.

Ask them to explain how it feels in temperature readings such as  $11^{\circ}\text{C}$ ,  $2^{\circ}\text{C}$ , and  $23^{\circ}\text{C}$ . Always use the term “degrees Celsius,” not “five degrees.”

Once students are familiar with the purpose of the thermometer, it is important that they have many experiences measuring temperatures (ice water, warm water, outside air, inside air, body temperature). These experiences will give them a conceptual base for the estimation of temperature. It is essential that children learn the temperature benchmarks, such as ordinary room temperature, freezing, the boiling point of water, and so on. Temperature estimation is different from other estimation because it involves choosing a temperature between two known benchmarks.

## Temperature

Joan wanted to tell her friends how warm it was.

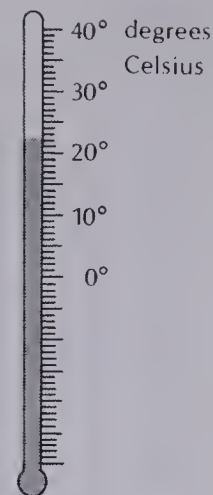
The thermometer outside showed the liquid between the  $20^{\circ}$  and the  $30^{\circ}$  marks.

Joan looked more closely.

The liquid was 2 marks above the  $20^{\circ}$  mark.

The temperature was  $22^{\circ}\text{C}$ .

“ $^{\circ}\text{C}$ ” is the symbol for “degrees Celsius”.



### EXERCISES

1.



What temperature is the pop?  $5^{\circ}\text{C}$

2.



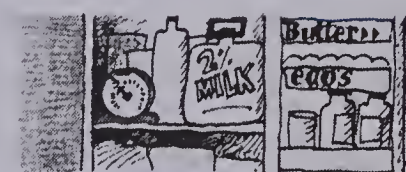
What temperature is the hot chocolate?  $80^{\circ}\text{C}$

3.



What temperature is the air in the room?  $20^{\circ}\text{C}$

4.



What temperature is the air in the refrigerator?  $3^{\circ}\text{C}$

5. What is the temperature at which water freezes?  $0^{\circ}\text{C}$

6. What is the temperature at which water boils?  $100^{\circ}\text{C}$

40

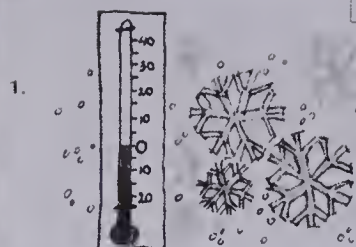
### Using the Exercises

- Discuss each question. Ask the students for other examples of things that are of about the same temperature as those given.
- The exercises may be extended to the classifying of temperatures in lists labelled *hot*, *warm*, *cool*, *cold*.
- If students do not know the answers to questions 5 and 6, allow them to guess. Lead them to ask themselves questions about each guess. For example, regarding question 5:

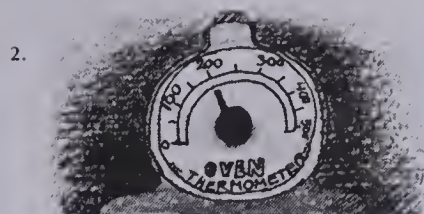
Student:  $10^{\circ}\text{C}$ .

Teacher: That's about the temperature outside today (if this can be said truthfully). Is water freezing now?

## PRACTICE



1. What temperature is the air outside?  $0^{\circ}\text{C}$



2. What temperature is the air in the oven?  $200^{\circ}\text{C}$

3. Draw a thermometer showing  $25^{\circ}\text{C}$ .

4. Draw a thermometer showing  $38^{\circ}\text{C}$ .

Add or subtract the temperatures.

5.  $14^{\circ}\text{C} + 3^{\circ}\text{C} = 17^{\circ}\text{C}$  6.  $24^{\circ}\text{C} + 9^{\circ}\text{C} = 33^{\circ}\text{C}$  7.  $16^{\circ}\text{C} - 8^{\circ}\text{C} = 8^{\circ}\text{C}$  8.  $25^{\circ}\text{C} - 13^{\circ}\text{C} = 12^{\circ}\text{C}$

## REVIEW

Add.

A5	1. 8 3 +2 <u>13</u>	2. 5 1 +3 <u>9</u>	3. 6 4 +7 <u>17</u>	4. 8 9 +7 <u>24</u>	5. 9 9 +1 <u>19</u>
----	------------------------------	-----------------------------	------------------------------	------------------------------	------------------------------

Subtract.

A6	6. 65 -31 <u>34</u>	7. 28 -15 <u>13</u>	8. 56 -3 <u>53</u>	9. 95 -71 <u>24</u>	10. 34 -22 <u>12</u>
----	---------------------------	---------------------------	--------------------------	---------------------------	----------------------------

A7	11. 23 -5 <u>18</u>	12. 44 -9 <u>35</u>	13. 87 -8 <u>79</u>	14. 51 -6 <u>45</u>	15. 46 -8 <u>38</u>
----	---------------------------	---------------------------	---------------------------	---------------------------	---------------------------

Add or subtract.

A8	16. 614 +352 <u>966</u>	17. 749 +150 <u>899</u>	18. 865 -233 <u>632</u>	19. 345 -214 <u>131</u>	20. 648 -32 <u>616</u>
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## Assigning the Practice

Minimum: 1-8

Average: 1-8

Enriched: 1-8

## Review Exercises

Questions	Objective	Pages
1-5	A5	30-31
6-10	A6	32-33
11-15	A7	34-35
16-20	A8	36-37

## Reinforcement

1. Ask the students to measure and record the temperature outside at four different times during the day (at 9 am, 11 am, 1 pm, and 3 pm).

2. Ask various students to make a record of the temperature outside at noon for one week. Have them colour the temperatures on a thermometer worksheet and show them on a graph.

3. Use the newspaper weather map to assign this task. Have the students compare the temperatures of various cities, colour them on a thermometer worksheet, and show them on a graph.

## Enrichment

Discuss temperatures *below zero*. Show the students the notation:  $-12^{\circ}\text{C}$  ("minus twelve degrees Celsius"). Talk about temperature extremes in various climates. Some students might like to do a library research project on the high and low temperatures in various places in Canada (or in other countries) at certain times of the year and then colour them on a thermometer worksheet.

## Extra Practice

## Worksheet M2

Pages 40-41

Estimate. Check by measuring.

- Air temperature near the ceiling of the classroom
- Drinking fountain water temperature
- Outside air temperature

Add or subtract the temperatures.

- $21^{\circ}\text{C} + 8^{\circ}\text{C} = 29^{\circ}\text{C}$
- $29^{\circ}\text{C} - 6^{\circ}\text{C} = 23^{\circ}\text{C}$
- $33^{\circ}\text{C} + 24^{\circ}\text{C} = 57^{\circ}\text{C}$
- $98^{\circ}\text{C} - 46^{\circ}\text{C} = 52^{\circ}\text{C}$
- On Monday afternoon the temperature was  $15^{\circ}\text{C}$ . By evening it had dropped  $2^{\circ}\text{C}$ . What was the temperature then?  $13^{\circ}\text{C}$



Unit 2 Objective	Test Questions	Pages
A1	1-2, 8	22-23
A2	3-7, 9	24-25
A3	10-11	26-27
A4	15-17, 27	28-29
A5	20-26	30-31
A6	12-14	32-33
A7	18-19, 28	34-35
A8	29-33	36-37
PS	34-36	

# TEST

# UNIT 2

Add or subtract.

$$\begin{array}{r} 1. \quad 7 \\ + 4 \\ \hline 11 \end{array}$$

$$\begin{array}{r} 2. \quad 6 \\ + 3 \\ \hline 9 \end{array}$$

$$\begin{array}{r} 3. \quad 8 \\ + 9 \\ \hline 17 \end{array}$$

$$\begin{array}{r} 4. \quad 14 \\ - 6 \\ \hline 8 \end{array}$$

$$\begin{array}{r} 5. \quad 17 \\ - 9 \\ \hline 8 \end{array}$$

$$6. \quad 6 + 9 = 15$$

$$7. \quad 8 + 8 = 16$$

$$8. \quad 12 - 5 = 7$$

$$9. \quad 15 - 7 = 8$$

$$\begin{array}{r} 10. \quad 28 \\ + 21 \\ \hline 49 \end{array}$$

$$\begin{array}{r} 11. \quad 13 \\ + 74 \\ \hline 87 \end{array}$$

$$\begin{array}{r} 12. \quad 65 \\ - 2 \\ \hline 63 \end{array}$$

$$\begin{array}{r} 13. \quad 26 \\ - 12 \\ \hline 14 \end{array}$$

$$\begin{array}{r} 14. \quad 94 \\ - 34 \\ \hline 60 \end{array}$$

$$\begin{array}{r} 15. \quad 35 \\ + 8 \\ \hline 43 \end{array}$$

$$\begin{array}{r} 16. \quad 9 \\ + 16 \\ \hline 25 \end{array}$$

$$\begin{array}{r} 17. \quad 87 \\ + 3 \\ \hline 90 \end{array}$$

$$\begin{array}{r} 18. \quad 64 \\ - 5 \\ \hline 59 \end{array}$$

$$\begin{array}{r} 19. \quad 47 \\ - 9 \\ \hline 38 \end{array}$$

$$\begin{array}{r} 20. \quad 1 \\ 4 \\ + 3 \\ \hline 8 \end{array}$$

$$\begin{array}{r} 21. \quad 5 \\ 4 \\ + 8 \\ \hline 17 \end{array}$$

$$\begin{array}{r} 22. \quad 8 \\ 5 \\ + 9 \\ \hline 22 \end{array}$$

$$\begin{array}{r} 23. \quad 24 \\ 14 \\ + 51 \\ \hline 89 \end{array}$$

$$\begin{array}{r} 24. \quad 34 \\ 51 \\ + 12 \\ \hline 97 \end{array}$$

$$25. \quad 5 + 3 + 2 = 10$$

$$26. \quad 7 + 6 + 8 = 21$$

$$27. \quad 29 + 5 = 34$$

$$28. \quad 82 - 9 = 73$$

$$\begin{array}{r} 29. \quad 763 \\ + 221 \\ \hline 984 \end{array}$$

$$\begin{array}{r} 30. \quad 200 \\ + 409 \\ \hline 609 \end{array}$$

$$\begin{array}{r} 31. \quad 580 \\ + 204 \\ \hline 784 \end{array}$$

$$\begin{array}{r} 32. \quad 897 \\ - 101 \\ \hline 796 \end{array}$$

$$\begin{array}{r} 33. \quad 556 \\ - 234 \\ \hline 322 \end{array}$$

Solve.

34. There are 16 girls and 13 boys in Eva's class.  
How many people are in the class? **29**

35. Max had 75¢ in his pocket before he went to the store.  
He spent 50¢. **25¢**  
How much does he have left?

36. On Tuesday night the temperature was 19°C.  
During the night it fell 5°C.  
What was the temperature the next morning? **14°C**

## Post-test

## Unit 2

Add or subtract.

$$\begin{array}{r} 1. \quad 7 \\ + 5 \\ \hline 12 \end{array}$$

$$\begin{array}{r} 2. \quad 4 \\ + 6 \\ \hline 10 \end{array}$$

$$\begin{array}{r} 3. \quad 8 \\ + 7 \\ \hline 15 \end{array}$$

$$\begin{array}{r} 4. \quad 15 \\ - 9 \\ \hline 6 \end{array}$$

$$\begin{array}{r} 5. \quad 16 \\ - 7 \\ \hline 9 \end{array}$$

$$6. \quad 5 + 9 = 14$$

$$7. \quad 9 + 7 = 16$$

$$8. \quad 12 - 6 = 6$$

$$9. \quad 17 - 8 = 9$$

$$\begin{array}{r} 10. \quad 31 \\ + 43 \\ \hline 74 \end{array}$$

$$\begin{array}{r} 11. \quad 15 \\ + 74 \\ \hline 89 \end{array}$$

$$\begin{array}{r} 12. \quad 68 \\ - 6 \\ \hline 62 \end{array}$$

$$\begin{array}{r} 13. \quad 62 \\ - 21 \\ \hline 41 \end{array}$$

$$\begin{array}{r} 14. \quad 85 \\ - 44 \\ \hline 41 \end{array}$$

$$\begin{array}{r} 15. \quad 38 \\ + 8 \\ \hline 46 \end{array}$$

$$\begin{array}{r} 16. \quad 17 \\ + 9 \\ \hline 26 \end{array}$$

$$\begin{array}{r} 17. \quad 6 \\ + 54 \\ \hline 60 \end{array}$$

$$\begin{array}{r} 18. \quad 75 \\ - 8 \\ \hline 67 \end{array}$$

$$\begin{array}{r} 19. \quad 32 \\ - 5 \\ \hline 27 \end{array}$$

$$\begin{array}{r} 20. \quad 1 \\ 5 \\ + 4 \\ \hline 10 \end{array}$$

$$\begin{array}{r} 21. \quad 8 \\ 7 \\ + 2 \\ \hline 17 \end{array}$$

$$\begin{array}{r} 22. \quad 6 \\ 6 \\ + 6 \\ \hline 18 \end{array}$$

$$\begin{array}{r} 23. \quad 25 \\ 31 \\ + 11 \\ \hline 67 \end{array}$$

$$\begin{array}{r} 24. \quad 62 \\ 22 \\ + 12 \\ \hline 96 \end{array}$$

## NUMERATION

Copy each pair of numbers. Put  $<$ ,  $=$ , or  $>$  in place of the  $\blacksquare$  to make a true statement.

1. 43  $\blacksquare$  34
2. 8  $\blacksquare$  80
3. 26  $\blacksquare$  26
4. 285  $\blacksquare$  302
5. 659  $\blacksquare$  695
6. 926  $\blacksquare$  922
7. 3568  $\blacksquare$  2435
8. 25 697  $\blacksquare$  9875
9. 316 708  $\blacksquare$  318 250
10. \$1.95  $\blacksquare$  \$3.87
11. \$2.06  $\blacksquare$  \$0.98
12. \$0.85  $\blacksquare$  \$0.85

Write in standard form.

13. three hundred sixty-five 365
14. eight hundred four 804
15. 3 thousand + 4 hundred + 0 tens + 9 ones 3409
16. 4000 + 600 + 20 + 7 4627
17. 9000 + 40 + 1 9041
18. 200 000 + 60 000 + 3000 + 800 + 90 + 7 263 897
19. 300 000 + 600 + 1 300 601

Write the place value of the underlined digit.

7hundreds

20. 259 047 9 thousands
21. 61 382 6 ten thousands
22. 536 410 5 hundred thousands
23. 89 712

Round to the nearest ten and hundred.

24. 1864 1860  
1900
25. 35 029 35 030  
35 000
26. 812 472 812 470  
812 500
27. 50 973 50 970  
51 000

Write with numerals and an ordinal ending.

28. twenty-first 21<sup>st</sup>
29. eighty-second 82<sup>nd</sup>
30. twelfth 12<sup>th</sup>

Write the numeral in standard form.

31. IV 4
32. XXIX 29
33. XCII 92
34. XV 15
35. LXV 65

25.  $4 + 4 + 3 =$  11
26.  $8 + 3 + 5 =$  16
27.  $39 + 8 =$  47
28.  $67 - 8 =$  59
29.  $\begin{array}{r} 861 \\ + 135 \\ \hline 996 \end{array}$
30.  $\begin{array}{r} 285 \\ + 304 \\ \hline 589 \end{array}$
31.  $\begin{array}{r} 682 \\ - 462 \\ \hline 220 \end{array}$
32.  $\begin{array}{r} 755 \\ - 503 \\ \hline 252 \end{array}$
33.  $\begin{array}{r} 881 \\ - 671 \\ \hline 210 \end{array}$

Solve.

34. Ranjan saved 68¢. Her mother gave her 5¢.  
How much money does she have? 73 ¢
35. There were 28 questions on the test.  
Carlo got 9 wrong answers. 19  
How many did he get right?
36. Jane had 89¢ in her piggy bank. Mario had 65¢ in his bank.  
How much more money did Jane have? 24 ¢

# UNIT 3

## Addition and Subtraction

Theme: Sports

Lesson		Objective	Pages
Preview		Add two- and three-digit numbers and three addends, without regrouping.	45
1	A9	Add two- and three-digit numbers, regroup ones.	46-47
2	A10	Add two- and three-digit numbers, regroup tens.	48-49
3	A11	Add two- and three-digit numbers, regroup ones and tens.	50-51
4	A12	Add three- and four-digit numbers, regroup ones, tens, and hundreds.	52-53
5	A13	Subtract two-digit numbers, regroup tens.	54-55
6	A14	Subtract three-digit numbers, regroup tens.	56-57
7	A15	Subtract three-digit numbers, regroup tens and hundreds.	58-59
8	A16	Subtract four-digit numbers, regroup tens, hundreds, and thousands.	60-61
9	A17	Round to estimate sums and differences with numbers of up to four digits.	62-63
10	PS3	Use a problem solving strategy.	64-65
Test		Addition and subtraction	66
Review		Problem solving	67



# About This Unit

The purpose of this unit is:

1. to develop skills in the addition and subtraction of up to four-digit numbers with regrouping.
2. to use rounding skills to estimate sums and differences.
3. to apply addition and subtraction skills to problem situations.

In order for the student to succeed with this unit it is essential that he or she have a good understanding of these prerequisite skills.

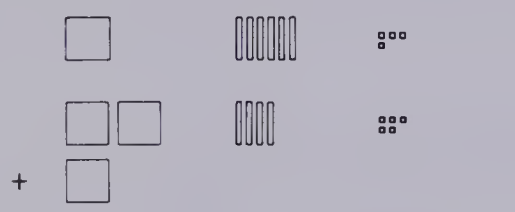
## 1. Place value

As regrouping is a key concept in this unit, a background understanding of the values of the places in our number system is essential.

## 2. Basic facts

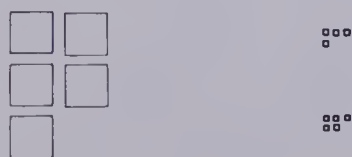
Quick recall of basic addition and subtraction facts is very important. Frequent drill of the facts should be an ongoing effort throughout the year.

The lessons of this unit are sequential and should be studied in the given order for maximum benefit. Each lesson begins with a concrete example of the new concept. Place-value number blocks and charts are frequently used to provide an easy-to-grasp idea of the regrouping steps of addition and subtraction. The following is how the addition  $164 + 345$  would be modelled with number blocks.



“Begin by adding the cubes.”  $4 + 5 = 9$  cubes.

“Add the rods. Since there are 10 rods, regroup them as 1 flat and 0 rods. Add the flats.”



There are 5 flats and 9 cubes;  
or, 5 hundreds and 9 ones; or,  $500 + 9$ ; or, 509.

The first half of the unit is all addition problems and most of the second half is subtraction problems. Consequently the students should be familiar with the different ways addition and subtraction problems can be asked and recognize *key words* as they decide on addition or subtraction in a set of mixed word problems. Estimation by rounding is undertaken once addition and subtraction skills have been developed as a means of checking the reasonableness of answers.

## Ideas

The theme of this unit is *Sports*. Start a bulletin board display on this theme. Have students bring in sports clippings from newspapers and magazines. Each day, ask them to find examples from which they could make up problems that would illustrate the lesson.

Examples: Distances in races.

Time in races.

Point totals.

Attendance at sporting events.

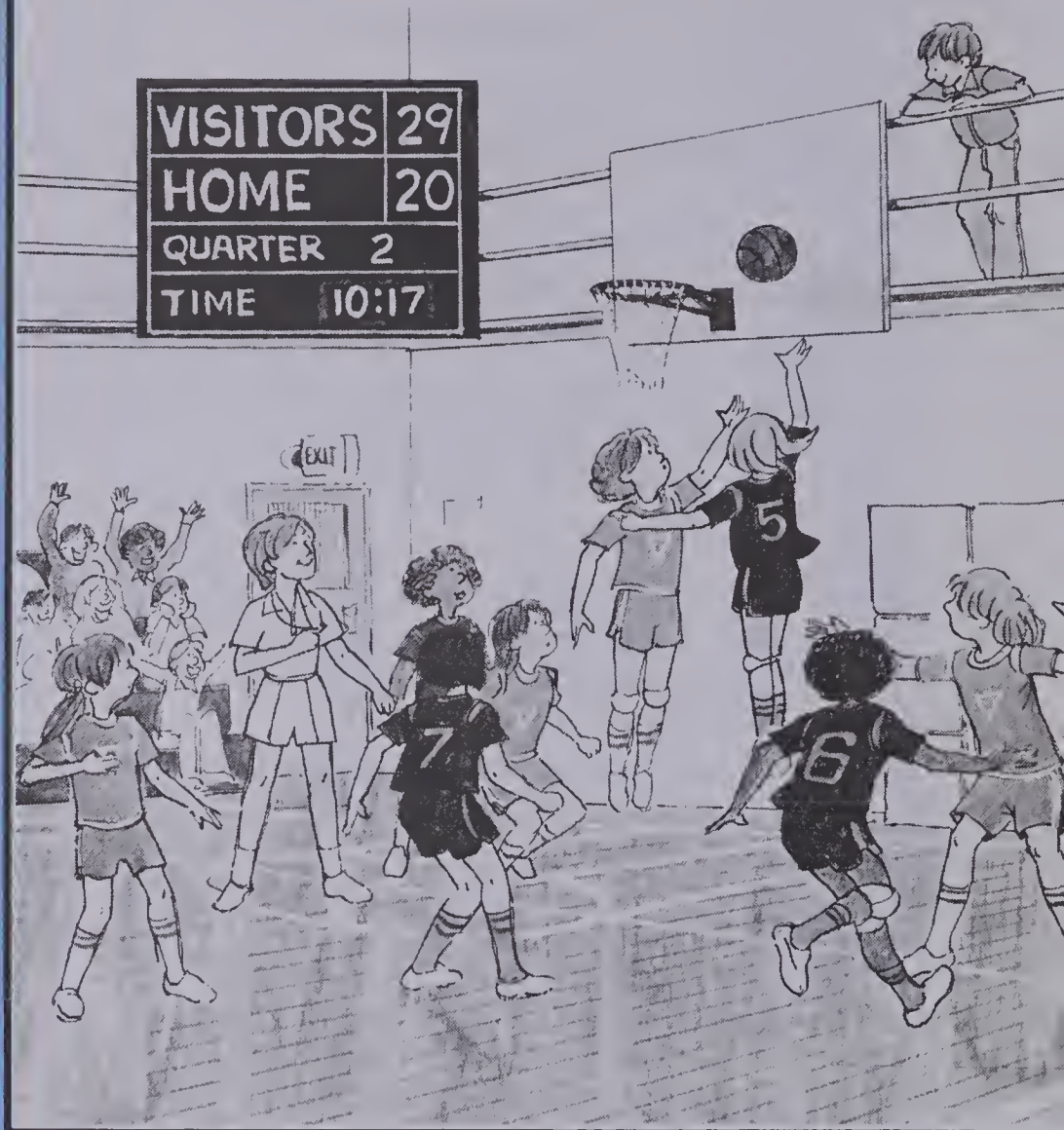
Time to play in a game.

Distances in track and field (jumping, throwing discus, javelin, shot-put)

Measurements of playing fields for various sports.

# UNIT 3

## ADDITION AND SUBTRACTION



Unit 3 Objective	Test Questions	Pages
A9	1-4, 9, 10	46-47
A10	5-8, 11, 12	48-49
A11	13-16	50-51
A12	17-20	52-53
A13	21-23	54-55
A14	24, 25	56-57
A15	26, 27	58-59
A16	28-30	60-61
A17	31-35	62-63
PS	36	

### Pretest

Add.

1. $\begin{array}{r} 27 \\ + 45 \\ \hline 72 \end{array}$	2. $\begin{array}{r} 88 \\ + 9 \\ \hline 97 \end{array}$	3. $\begin{array}{r} 328 \\ + 65 \\ \hline 393 \end{array}$	4. $\begin{array}{r} 247 \\ + 314 \\ \hline 561 \end{array}$	5. $\begin{array}{r} 67 \\ + 52 \\ \hline 119 \end{array}$
6. $\begin{array}{r} 98 \\ + 81 \\ \hline 179 \end{array}$	7. $\begin{array}{r} 265 \\ + 542 \\ \hline 807 \end{array}$	8. $\begin{array}{r} 381 \\ + 477 \\ \hline 858 \end{array}$	9. $\begin{array}{r} 26 \\ 35 \\ + 24 \\ \hline 85 \end{array}$	10. $\begin{array}{r} 277 \\ 105 \\ + 209 \\ \hline 591 \end{array}$
11. $\begin{array}{r} 32 \\ 64 \\ + 91 \\ \hline 187 \end{array}$	12. $\begin{array}{r} 356 \\ 21 \\ + 282 \\ \hline 659 \end{array}$	13. $\begin{array}{r} 349 \\ + 267 \\ \hline 616 \end{array}$	14. $\begin{array}{r} 518 \\ + 287 \\ \hline 805 \end{array}$	15. $\begin{array}{r} 135 \\ 28 \\ + 96 \\ \hline 259 \end{array}$

### Unit 3

## Scorecards

Find the totals for each sport

### BOWLING

Team A	
Bob	142
Jan	124
Bill	131
Total	397

Team B	
Erik	93
Pat	205
Ed	100
Total	398

Team C	
Marj	184
Mark	111
Jean	104
Total	399

### BASKETBALL

	Browns	Blues
First half	33	44
Second half	51	41
Total score	84	85

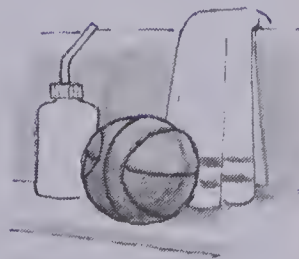
	Ants	Anteaters
First half	55	27
Second half	31	60
Total score	86	87

### DIVING

	Kay	Elsa	Barb	Maria	Sue	Carmen
First dive	40	32	24	24	30	40
Second dive	24	31	41	32	36	28
Third dive	30	32	31	41	32	31
Total	94	95	96	97	98	99

### BASEBALL

Hits	Cal	Stan	Jon
First year	114	107	119
Second year	113	121	110
Total	227	228	229
Errors	Cal	Stan	Jon
First year	24	20	28
Second year	13	18	11
Total	37	38	39



45

## UNIT 3 PREVIEW

### Suggestions

Display newspaper and magazine pictures of several different sports. Use these to initiate a discussion of the students' favourite sports. Talk about the ways the score is kept for each sport. Be sure that the scoring of bowling, basketball, diving, and baseball is talked about. Discuss, too, other statistics (besides the score) that are kept for some sports. For example, in baseball, records are kept of total hits, errors, home runs, stolen bases, strikeouts, etc.

### About the Page

Before the students do the required additions on page 45, point out and discuss each of the four types of scorecards. Discuss the statistics given and check the students' understanding with questions like, "Who had the best bowling average?", "Who scored the most points in her second dive?", and "Who had the least errors in the first baseball year?"

All students should attempt the addition review exercises on page 45. The totals for each athlete's score can be found without any regrouping. If the students can do this page with ease, they should be able to proceed more comfortably with the lessons of this unit.

### Reinforcement

Using a current newspaper sports page, devise scorecards similar to those on page 45 from the actual scores of famous athletes. Display each card on the chalkboard ledge for the class to read and total the scores. Encourage interested students to devise other similar scorecards.

16. $\begin{array}{r} 304 \\ 416 \\ + 87 \\ \hline 807 \end{array}$	17. $\begin{array}{r} 3865 \\ + 2143 \\ \hline 6008 \end{array}$	18. $\begin{array}{r} 9178 \\ + 286 \\ \hline 9464 \end{array}$	19. $\begin{array}{r} 3575 \\ + 2446 \\ \hline 6021 \end{array}$	20. $\begin{array}{r} 7843 \\ + 1499 \\ \hline 9342 \end{array}$
---	--	---	--	--

Subtract.

21. $\begin{array}{r} 68 \\ - 29 \\ \hline 39 \end{array}$	22. $\begin{array}{r} 32 \\ - 18 \\ \hline 14 \end{array}$	23. $\begin{array}{r} 80 \\ - 24 \\ \hline 56 \end{array}$	24. $\begin{array}{r} 365 \\ - 127 \\ \hline 238 \end{array}$	25. $\begin{array}{r} 435 \\ - 206 \\ \hline 229 \end{array}$
26. $\begin{array}{r} 644 \\ - 484 \\ \hline 160 \end{array}$	27. $\begin{array}{r} 700 \\ - 256 \\ \hline 444 \end{array}$	28. $\begin{array}{r} 6532 \\ - 650 \\ \hline 5882 \end{array}$	29. $\begin{array}{r} 4857 \\ - 1909 \\ \hline 2948 \end{array}$	30. $\begin{array}{r} 7026 \\ - 5137 \\ \hline 1889 \end{array}$

Round to the nearest ten.

31. $86 \rightarrow 90$	32. $754 \rightarrow 750$	33. $5695 \rightarrow 5700$
-------------------------	---------------------------	-----------------------------

Round to the nearest hundred.

34. $945 \rightarrow 900$	35. $2652 \rightarrow 2700$
---------------------------	-----------------------------



UNIT 3 LESSON 1

Objective A9

Add two- and three-digit numbers, regroup ones.

Introducing the Lesson

Review the place value of two- and three-digit numbers with number-block models.



Two flats, five rods and three cubes.  $200 + 50 + 3$   
2 hundreds, 5 tens, and 3 ones. 253

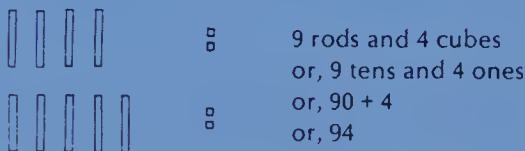
Try several similar examples.

Teaching the Lesson

Read and discuss the basketball game score at the top of page 46. Model the addition with number blocks, stressing the regrouping steps. Note, too, that it is easiest to add the cubes first.



Add the cubes. Since there are 14 cubes, **regroup** them as 1 rod and 4 cubes. Then add the rods.

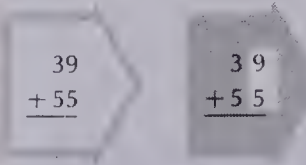


10s	1s
1	
3	9
+5	5
9	4

Write several addition problems of two- and three-digit addends on the chalk-board. Have individual students find the sums for each by modelling the addition with number blocks and explaining the regrouping step to the rest of class. Another student can record the algorithm on the chalk-board. Problems with three addends should also be included.

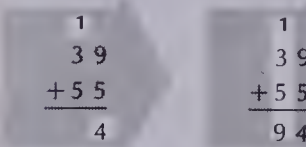
Regrouping Ones

Write the question. Add ones.  
 $9 + 5 = 14$



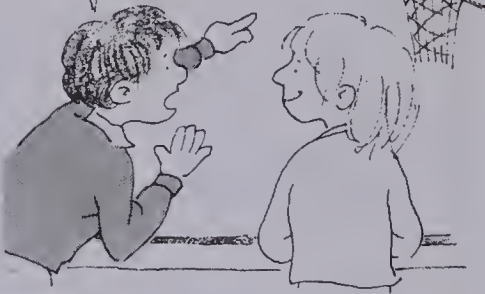
14 is 1 ten and 4 ones.

Write. Add tens.



HOW MANY POINTS HAVE BEEN SCORED?

VISITORS	39
HOME	55



94 points have been scored.

EXERCISES

Add.

1. $\begin{array}{r} 8 \\ + 7 \\ \hline 15 \end{array}$	2. $\begin{array}{r} 38 \\ + 7 \\ \hline 45 \end{array}$	3. $\begin{array}{r} 38 \\ + 47 \\ \hline 85 \end{array}$	4. $\begin{array}{r} 6 \\ + 5 \\ \hline 11 \end{array}$	5. $\begin{array}{r} 76 \\ + 5 \\ \hline 81 \end{array}$
6. $\begin{array}{r} 76 \\ + 15 \\ \hline 91 \end{array}$	7. $\begin{array}{r} 9 \\ + 6 \\ \hline 15 \end{array}$	8. $\begin{array}{r} 29 \\ + 6 \\ \hline 35 \end{array}$	9. $\begin{array}{r} 29 \\ + 26 \\ \hline 55 \end{array}$	10. $\begin{array}{r} 42 \\ + 48 \\ \hline 90 \end{array}$
11. $\begin{array}{r} 55 \\ + 27 \\ \hline 82 \end{array}$	12. $\begin{array}{r} 64 \\ + 28 \\ \hline 92 \end{array}$	13. $\begin{array}{r} 49 \\ + 39 \\ \hline 88 \end{array}$	14. $\begin{array}{r} 38 \\ + 58 \\ \hline 96 \end{array}$	15. $\begin{array}{r} 27 \\ + 37 \\ \hline 64 \end{array}$
16. $\begin{array}{r} 218 \\ + 19 \\ \hline 237 \end{array}$	17. $\begin{array}{r} 128 \\ + 236 \\ \hline 364 \end{array}$	18. $\begin{array}{r} 9 \\ + 437 \\ \hline 446 \end{array}$	19. $\begin{array}{r} 13 \\ 24 \\ + 35 \\ \hline 72 \end{array}$	20. $\begin{array}{r} 613 \\ 156 \\ + 114 \\ \hline 883 \end{array}$

46

Using the Exercises

- Questions 1 to 9 are arranged in groups of three, proceeding from a basic number fact (Objectives A1 and A2), to regrouping when adding two digits to one digit (Objective A4), to adding two digits to two digits—all with the same ones digit. Thus the students proceed to the objectives of this lesson from the skills already mastered.
- The remaining exercises are mixed and provide examples with zero in the sum, doubles, three digits (added to one, two, or three digits), and three addends (involving two and three digits). Watch for difficulties with any of these types and provide assistance before assigning the Practice.

## PRACTICE

Find the sum.

1.  $\begin{array}{r} 8 \\ + 65 \\ \hline 73 \end{array}$
2.  $\begin{array}{r} 19 \\ + 9 \\ \hline 28 \end{array}$
3.  $\begin{array}{r} 67 \\ + 25 \\ \hline 92 \end{array}$
4.  $\begin{array}{r} 9 \\ + 84 \\ \hline 93 \end{array}$
5.  $\begin{array}{r} 48 \\ + 22 \\ \hline 70 \end{array}$
6.  $\begin{array}{r} 28 \\ + 28 \\ \hline 56 \end{array}$
7.  $\begin{array}{r} 26 \\ + 55 \\ \hline 81 \end{array}$
8.  $\begin{array}{r} 73 \\ + 19 \\ \hline 92 \end{array}$
9.  $\begin{array}{r} 57 \\ + 3 \\ \hline 60 \end{array}$
10.  $\begin{array}{r} 47 \\ + 47 \\ \hline 94 \end{array}$
11.  $\begin{array}{r} 138 \\ + 3 \\ \hline 141 \end{array}$
12.  $\begin{array}{r} 229 \\ + 36 \\ \hline 265 \end{array}$
13.  $\begin{array}{r} 185 \\ + 305 \\ \hline 490 \end{array}$
14.  $\begin{array}{r} 752 \\ + 129 \\ \hline 881 \end{array}$
15.  $\begin{array}{r} 68 \\ + 923 \\ \hline 991 \end{array}$

Solve.

16. During the first half of the hockey season, Robert scored 24 goals and had 27 assists. How many points did Robert have? **51**
17. The girls' All-Star basketball team scored 45 points in one game and 49 points in the next game. How many points did the team score in the two games? **94**
18. A football team scored 7 points in the first half and 17 points in the second half. How many points did the team score in the game? **24**

## USING THE CALCULATOR

What digits are missing?

Check the results with a calculator.

1.  $\begin{array}{r} 36 \\ + \blacksquare 5 \\ \hline 61 \end{array}$
2.  $\begin{array}{r} 2 \blacksquare 9 \\ + 42 \\ \hline 71 \end{array}$
3.  $\begin{array}{r} 2 \blacksquare 5 \\ + 336 \\ \hline 561 \end{array}$
4.  $\begin{array}{r} \blacksquare 44 \\ + 12 \blacksquare 7 \\ \hline 671 \end{array}$
5.  $\begin{array}{r} \blacksquare 3 \blacksquare 8 \\ + 3 \blacksquare 2 \\ \hline 860 \end{array}$

47

## Assigning the Practice

Minimum: odd numbers

Average: 1-18

Enriched: 6-18

## Reinforcement

1. Prepare worksheet practice that requires the students to complete extensions of addition skills in this way: If you know  $9 + 7 = 16$ , it's easy to do  $19 + 7$ .

$29 + 7$

$119 + 7$

$129 + 7$  etc.

2. Two blank cubes used as dice can be played with in a variety of ways. Here are two suggestions for cubes labelled 9, 19, 29, 39, 49, 59 and 4, 5, 6, 7, 8, 9.

a. A student can roll the dice and record the numbers that turn up as an addition question, e.g.,  $39 + 6$ . After making up ten questions the student can then work the answers.

b. Two players roll for the highest sum to see who plays first. One player rolls a sum and gives the answer. If correct, he or she scores 2 points; if incorrect he or she loses 1 point. The first player to score 10 points is the winner.

## Enrichment

1. Assign *Using the Calculator*, page 47. Students who understand regrouping in addition will do this exercise quickly. Others will come to a better understanding of the objective by discovering the answers by trial and error, preferably with the use of a calculator.

2. Have the students study the following diagram and then find the corresponding sums.

18	9	19
15	22	7
28	13	17

a.  $\square + \square = ?$

b.  $\square + \square = ?$

c.  $\square + \square = ?$

d.  $\square + \square + \square = ?$

e.  $\square + \square + \square = ?$

## Extra Practice

## Worksheet A9

Pages 46-47

Rewrite the number of ones as tens and ones.

1. 13 ones = 1 ten + 3 ones
2. 17 ones = 1 ten + 7 ones
3. 24 ones = 2 tens + 4 ones
4. 19 ones = 1 ten + 9 ones
5. 53 ones = 5 tens + 3 ones
6. 10 ones = 1 ten + 0 ones
7. 35 ones = 3 tens + 5 ones
8. 20 ones = 2 tens + 0 ones

Add.

9.  $\begin{array}{r} 28 \\ + 7 \\ \hline 35 \end{array}$
10.  $\begin{array}{r} 35 \\ + 16 \\ \hline 51 \end{array}$
11.  $\begin{array}{r} 49 \\ + 43 \\ \hline 92 \end{array}$
12.  $\begin{array}{r} 4 \\ + 26 \\ \hline 30 \end{array}$
13.  $\begin{array}{r} 239 \\ + 146 \\ \hline 385 \end{array}$

14. A goaltender shut out opposing teams for the last 46 min of one game and the first 34 min of the following game. How many minutes did the goalie play without allowing any goals? **80 min**

# UNIT 3 LESSON 2

## Objective A10

Add two- and three-digit numbers, regroup tens.

## Introducing the Lesson

Show the students the following models and ask them about the regrouping that should be done.



2 flats, 12 rods, 4 cubes

The students should decide that the 12 rods can be regrouped as 1 flat and 2 rods.



3 flats, 2 rods, 4 cubes

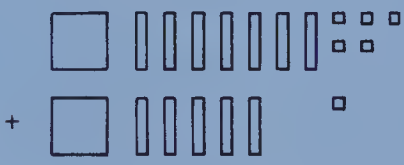
Summarize the modelling with these place-value charts.

100s	10s	1s	=	100s	10s	1s
2	12	4		3	2	4

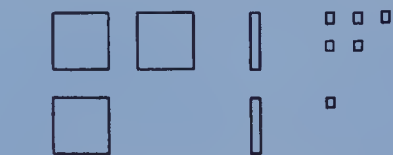
Try several other similar examples.

## Teaching the Lesson

Discuss the bowling problem at the top of page 48. Model the required addition with place-value number blocks. Point out that it is easiest to add cubes first.



"Adding cubes, there are 6. Add the rods. Since there are 12 rods, regroup them as 1 flat and 2 rods. Then add."



3 flats, 2 rods, 6 cubes  
or, 3 hundreds, 2 tens, 6 ones  
or,  $300 + 20 + 6$   
or, 326

Have the students practise modelling and recording several other similar addition examples. Use problems with three addends as well.

## Regrouping Tens

MY SCORES ARE 175 AND 151. WHAT'S MY TOTAL?

Write the question.

$$\begin{array}{r} 175 \\ + 151 \\ \hline \end{array}$$

Add ones.

$$\begin{array}{r} 175 \\ + 151 \\ \hline 6 \end{array}$$

Add tens.

$$\begin{array}{r} 175 \\ + 151 \\ \hline 126 \end{array}$$

12 tens is 1 hundred and 2 tens. Regroup.

$$\begin{array}{r} 175 \\ + 151 \\ \hline 26 \end{array}$$

Add hundreds.

$$\begin{array}{r} 175 \\ + 151 \\ \hline 326 \end{array}$$

The total score for the 2 games is 326.

## EXERCISES

Add.

1. $\begin{array}{r} 47 \\ + 60 \\ \hline 107 \end{array}$	2. $\begin{array}{r} 52 \\ + 64 \\ \hline 116 \end{array}$	3. $\begin{array}{r} 65 \\ + 83 \\ \hline 148 \end{array}$	4. $\begin{array}{r} 90 \\ + 33 \\ \hline 123 \end{array}$	5. $\begin{array}{r} 81 \\ + 84 \\ \hline 165 \end{array}$
6. $\begin{array}{r} 347 \\ + 60 \\ \hline 407 \end{array}$	7. $\begin{array}{r} 152 \\ + 64 \\ \hline 216 \end{array}$	8. $\begin{array}{r} 565 \\ + 83 \\ \hline 648 \end{array}$	9. $\begin{array}{r} 290 \\ + 33 \\ \hline 323 \end{array}$	10. $\begin{array}{r} 381 \\ + 84 \\ \hline 465 \end{array}$
11. $\begin{array}{r} 274 \\ + 382 \\ \hline 656 \end{array}$	12. $\begin{array}{r} 490 \\ + 255 \\ \hline 745 \end{array}$	13. $\begin{array}{r} 528 \\ + 191 \\ \hline 719 \end{array}$	14. $\begin{array}{r} 742 \\ + 170 \\ \hline 912 \end{array}$	15. $\begin{array}{r} 382 \\ + 382 \\ \hline 764 \end{array}$
16. $\begin{array}{r} 451 \\ + 450 \\ \hline 901 \end{array}$	17. $\begin{array}{r} 163 \\ + 466 \\ \hline 629 \end{array}$	18. $\begin{array}{r} 283 \\ + 571 \\ \hline 854 \end{array}$	19. $\begin{array}{r} 394 \\ + 482 \\ \hline 876 \end{array}$	20. $\begin{array}{r} 671 \\ + 291 \\ \hline 962 \end{array}$

48

## Using the Exercises

- Questions 1 to 5 are paired with Questions 6 to 10 to provide practice first with regrouping tens with two-digit addends and then with regrouping tens with a three- and a two-digit addend.
- Questions 11 to 20 provide examples with three-digit addends requiring the regrouping of tens.



## PRACTICE

Find the sum.

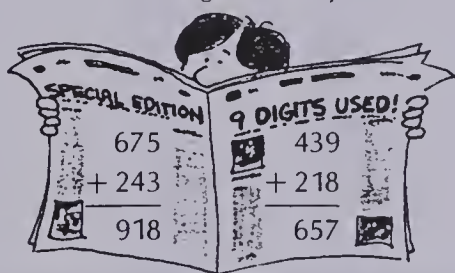
- |   |   |  |   |  |
|---|---|--|---|--|
| 1. $\begin{array}{r} 52 \\ + 67 \\ \hline 119 \end{array}$    | 2. $\begin{array}{r} 78 \\ + 91 \\ \hline 169 \end{array}$    | 3. $\begin{array}{r} 43 \\ + 92 \\ \hline 135 \end{array}$   | 4. $\begin{array}{r} 60 \\ + 84 \\ \hline 144 \end{array}$          | 5. $\begin{array}{r} 35 \\ + 83 \\ \hline 118 \end{array}$           |
| 6. $\begin{array}{r} 161 \\ + 263 \\ \hline 424 \end{array}$  | 7. $\begin{array}{r} 472 \\ + 180 \\ \hline 652 \end{array}$  | 8. $\begin{array}{r} 553 \\ + 283 \\ \hline 836 \end{array}$ | 9. $\begin{array}{r} 661 \\ + 174 \\ \hline 835 \end{array}$        | 10. $\begin{array}{r} 391 \\ + 267 \\ \hline 658 \end{array}$        |
| 11. $\begin{array}{r} 274 \\ + 274 \\ \hline 548 \end{array}$ | 12. $\begin{array}{r} 451 \\ + 478 \\ \hline 929 \end{array}$ | 13. $\begin{array}{r} 584 \\ + 95 \\ \hline 679 \end{array}$ | 14. $\begin{array}{r} 293 \\ 91 \\ + 102 \\ \hline 486 \end{array}$ | 15. $\begin{array}{r} 341 \\ 245 \\ + 231 \\ \hline 817 \end{array}$ |

Solve.

16. During a bowling tournament, Sam scored 180 and 178 for his first two games. What was Sam's total score for these two games? **358**
17. Joanne was practising for a bowling tournament and scored 189 and 191 on two games. What was her total score for the two games? **380**

## Special Addition

Each addition question below uses all of the digits from 1 to 9. Each digit is used just once.



Make up other addition questions like the ones above.

Many answers are possible.

Examples:

$$\begin{array}{r} 234 \\ + 657 \\ \hline 891 \end{array} \quad \begin{array}{r} 569 \\ + 214 \\ \hline 783 \end{array}$$

## Assigning the Practice

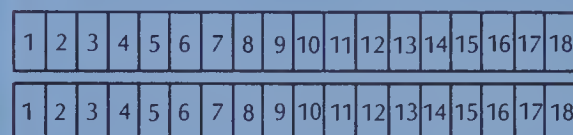
Minimum: 1-10

Average: 1-17

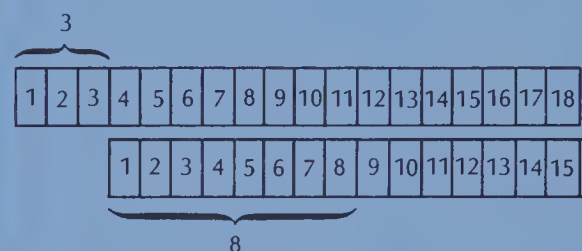
Enriched: 6-17

## Reinforcement

Students can make "adding machines" according to the following directions. Cut out two centimetre square strips. There should be at least 18 squares on each strip. Number the squares from left to right.



To add, for example,  $3 + 8$ , move the bottom strip so its left end is at the edge of the '3' square of the top strip. Then find the '8' on the bottom strip. The sum of 3 and 8 is above the '8' on the bottom strip.



## Enrichment

1. The *Special Addition* challenge, page 49, will have to be solved by a method of trial and error. It provides addition practice, but may be frustrating for all but the highly motivated students.

2. Ask the students to find a true statement about each:
- the sum of two even numbers;
  - the sum of two odd numbers; and
  - the sum of an even number and an odd number.

## Extra Practice

## Worksheet A10

Pages 48-49

Rewrite the number as hundreds and tens.

1. 11 tens = 1 hundred + 1 ten      2. 46 tens = 4 hundreds + 6 tens
3. 30 tens = 3 hundreds + 0 tens      4. 18 tens = 1 hundred + 8 tens

Add.

- |   |   |  |   |   |
|---|---|--|---|---|
| 5. $\begin{array}{r} 343 \\ + 182 \\ \hline 525 \end{array}$  | 6. $\begin{array}{r} 256 \\ + 71 \\ \hline 327 \end{array}$   | 7. $\begin{array}{r} 480 \\ + 390 \\ \hline 870 \end{array}$ | 8. $\begin{array}{r} 544 \\ + 95 \\ \hline 639 \end{array}$   | 9. $\begin{array}{r} 347 \\ + 261 \\ \hline 608 \end{array}$  |
| 10. $\begin{array}{r} 182 \\ + 777 \\ \hline 959 \end{array}$ | 11. $\begin{array}{r} 396 \\ + 112 \\ \hline 508 \end{array}$ | 12. $\begin{array}{r} 68 \\ + 341 \\ \hline 409 \end{array}$ | 13. $\begin{array}{r} 290 \\ + 675 \\ \hline 965 \end{array}$ | 14. $\begin{array}{r} 328 \\ + 280 \\ \hline 608 \end{array}$ |

UNIT 3 LESSON 3

Objective A11

Add two- and three-digit numbers, regroup ones and tens.

Introducing the Lesson

Show the students the following model. Discuss the places where regrouping can be done.



2 flats, 11 rods, 18 cubes

Regroup the 18 cubes to 1 rod and 8 cubes.



2 flats, 12 rods, 8 cubes

Regroup the 12 rods to 1 flat and 2 rods.



3 flats, 2 rods, 8 cubes

Record the regrouping in a place-value chart.

100s	10s	1s
2	11	18
2	12	8
3	2	8

Regroup the ones.

Regroup the tens.

Teaching the Lesson

Read and discuss the problem situation at the top of page 50. Model and record the required addition. Remind the students that cubes are added first.

Add the cubes. Since there are 15 cubes, regroup them as 1 rod and 5 cubes.

Add the rods. Since there are 14 rods, regroup them as 1 flat and 4 rods. Then add the flats.

100s	10s	1s
1	1	6
5	8	9
+2	5	
8	4	5

Both ones and tens are regrouped.

Ask the students to model and record several other similar examples. Most students will want to write the carried digit.

Encourage students who are capable of mentally regrouping to do so.

Regrouping Twice

WE'VE SOLD **586** HOT DOGS AND **259** HAMBURGERS! HOW MANY IS THAT ALTOGETHER?

Add ones.  
$$\begin{array}{r} 586 \\ +259 \\ \hline 5 \end{array}$$

Add tens.  
$$\begin{array}{r} 11 \\ 586 \\ +259 \\ \hline 45 \end{array}$$

Add hundreds.  
$$\begin{array}{r} 111 \\ 586 \\ +259 \\ \hline 845 \end{array}$$

$$\begin{array}{r} 586 \\ +259 \\ \hline 845 \end{array}$$

Altogether, 845 hot dogs and hamburgers were sold.

EXERCISES

Find the sum.

1. 
$$\begin{array}{r} 47 \\ +47 \\ \hline 94 \end{array}$$

6. 
$$\begin{array}{r} 140 \\ +291 \\ \hline 431 \end{array}$$

11. 
$$\begin{array}{r} 156 \\ +268 \\ \hline 424 \end{array}$$

16. 
$$\begin{array}{r} 381 \\ +589 \\ \hline 970 \end{array}$$

21. 
$$\begin{array}{r} 369 \\ +38 \\ \hline 407 \end{array}$$

2. 
$$\begin{array}{r} 63 \\ +17 \\ \hline 80 \end{array}$$

7. 
$$\begin{array}{r} 353 \\ +172 \\ \hline 525 \end{array}$$

12. 
$$\begin{array}{r} 484 \\ +199 \\ \hline 683 \end{array}$$

17. 
$$\begin{array}{r} 166 \\ +269 \\ \hline 435 \end{array}$$

22. 
$$\begin{array}{r} 99 \\ +254 \\ \hline 353 \end{array}$$

3. 
$$\begin{array}{r} 349 \\ +209 \\ \hline 558 \end{array}$$

8. 
$$\begin{array}{r} 461 \\ +284 \\ \hline 745 \end{array}$$

13. 
$$\begin{array}{r} 348 \\ +165 \\ \hline 513 \end{array}$$

18. 
$$\begin{array}{r} 485 \\ +355 \\ \hline 840 \end{array}$$

23. 
$$\begin{array}{r} 77 \\ 32 \\ +13 \\ \hline 122 \end{array}$$

4. 
$$\begin{array}{r} 418 \\ +278 \\ \hline 696 \end{array}$$

9. 
$$\begin{array}{r} 93 \\ +85 \\ \hline 178 \end{array}$$

14. 
$$\begin{array}{r} 284 \\ +576 \\ \hline 860 \end{array}$$

19. 
$$\begin{array}{r} 179 \\ +335 \\ \hline 514 \end{array}$$

24. 
$$\begin{array}{r} 48 \\ 25 \\ +43 \\ \hline 116 \end{array}$$

5. 
$$\begin{array}{r} 527 \\ +159 \\ \hline 686 \end{array}$$

10. 
$$\begin{array}{r} 187 \\ +62 \\ \hline 249 \end{array}$$

15. 
$$\begin{array}{r} 877 \\ +186 \\ \hline 1063 \end{array}$$

20. 
$$\begin{array}{r} 286 \\ +245 \\ \hline 531 \end{array}$$

25. 
$$\begin{array}{r} 145 \\ 252 \\ +115 \\ \hline 512 \end{array}$$

Using the Exercises

- Questions 1 to 5 involve regrouping only ones.
- Questions 6 to 10 involve regrouping tens only.
- Questions 11 to 15 involve regrouping tens and ones. Work through the questions to here with the students before assigning the balance of the exercises.
- Questions 16 to 25 also involve regrouping twice with a zero in the sum, with one two-digit addend, or with three addends. Watch for difficulties with any of these aspects of addition and provide assistance before assigning the Practice.

## PRACTICE

Add.

1.  $\begin{array}{r} 217 \\ + 688 \\ \hline 905 \end{array}$
2.  $\begin{array}{r} 526 \\ + 176 \\ \hline 702 \end{array}$
3.  $\begin{array}{r} 828 \\ + 82 \\ \hline 910 \end{array}$
4.  $\begin{array}{r} 51 \\ + 369 \\ \hline 420 \end{array}$
5.  $\begin{array}{r} 727 \\ + 195 \\ \hline 922 \end{array}$
6.  $\begin{array}{r} 335 \\ + 389 \\ \hline 724 \end{array}$
7.  $\begin{array}{r} 99 \\ + 688 \\ \hline 787 \end{array}$
8.  $\begin{array}{r} 493 \\ + 298 \\ \hline 791 \end{array}$
9.  $\begin{array}{r} 796 \\ + 109 \\ \hline 905 \end{array}$
10.  $\begin{array}{r} 258 \\ + 58 \\ \hline 316 \end{array}$
11.  $\begin{array}{r} 368 \\ + 154 \\ \hline 522 \end{array}$
12.  $\begin{array}{r} 482 \\ + 239 \\ \hline 721 \end{array}$
13.  $\begin{array}{r} 56 \\ + 95 \\ \hline 151 \end{array}$
14.  $\begin{array}{r} 248 \\ + 74 \\ \hline 322 \end{array}$
15.  $\begin{array}{r} 387 \\ + 219 \\ \hline 606 \end{array}$

Solve.

16. During the first two rounds of an archery competition, May had scores of 296 and 288. What was her total score after two rounds? **584**
17. Neil was practising for a trap-shooting competition. There are 200 clay birds in a round. He hit 197 clay birds the first round and 195 the second round. How many clay birds did he hit in the two rounds? **392**

## Arithmetic Magic

Write any 3-digit numeral.

Reverse the order of the digits to make a second numeral.

Subtract the smaller from the larger.

Show any zeros.

Reverse the order of the digits in the answer.

Add.

Now try other 3-digit numerals.

Explain what you notice about the answers.

582

285

Subtract.

297

792

Add.

1089

Remember this answer.

same

51

## Assigning the Practice

Minimum: 1-10, 16-17

Average: 6-17

Enriched: 6-17

## Reinforcement

1. Ask the students to write the following as standard form numbers.

- a. 

3	17	2
---	----	---
- b. 

6	18	19
---	----	----
- c. 

3	9	14
---	---	----
- d. 

5	13	11
---	----	----

2. Write the following addition squares on the chalkboard and have several students contribute to finding the sums.

Add across

Add down	→		
	148	154	
	363	279	

Add down	→		
	194	217	
	308	193	

Ask the students to make similar squares. These can be exchanged so that students complete each other's squares.

## Enrichment

1. In *Arithmetic Magic*, page 51, students will encounter the unfamiliar skill of addition with regrouping of hundreds, but all students should be able to discover the pattern with very little effort.

2. Ask the students to write a poem or story that requires addition to tell the story. Mount these and display them for the rest of the class to solve.

## Extra Practice

## Worksheet A11

Pages 50-51

Rewrite as hundreds and tens.

1. 12 tens = 1 hundred + 2 tens
2. 19 tens = 1 hundred + 9 tens
3. 10 tens = 1 hundred + 0 tens
4. 25 tens = 2 hundreds + 5 tens

Add.

5.  $\begin{array}{r} 451 \\ + 269 \\ \hline 720 \end{array}$
6.  $\begin{array}{r} 278 \\ + 426 \\ \hline 704 \end{array}$
7.  $\begin{array}{r} 449 \\ + 44 \\ \hline 493 \end{array}$
8.  $\begin{array}{r} 26 \\ + 274 \\ \hline 300 \end{array}$
9.  $\begin{array}{r} 398 \\ + 107 \\ \hline 505 \end{array}$
10.  $\begin{array}{r} 645 \\ + 172 \\ \hline 817 \end{array}$
11.  $\begin{array}{r} 381 \\ + 209 \\ \hline 590 \end{array}$
12.  $\begin{array}{r} 267 \\ + 575 \\ \hline 842 \end{array}$
13.  $\begin{array}{r} 348 \\ + 641 \\ \hline 989 \end{array}$
14.  $\begin{array}{r} 275 \\ + 276 \\ \hline 551 \end{array}$

Solve.

15. Sharon bowled two games and had scores of 227 and 235. What was her total score? **462**



# UNIT 3 LESSON 4

## Objective A12

Add three- and four-digit numbers, regroup ones, tens, and hundreds.

### Introducing the Lesson

The theme of the chapter is sports. Begin the lesson with a discussion of occasions in sports where addition is required. Point out the number of fans in the bleachers and in the main stands at the top of page 52. Review the place value of each digit.

1000s	100s	10s	1s
4	8	6	3
2	2	3	9

Ask someone to write each four-digit number in expanded form as place value is discussed.

$$4863 = 4000 + 800 + 60 + 3$$

$$2239 = 2000 + 200 + 30 + 9$$

### Teaching the Lesson

Point out that the problem at the top of page 52 requires that all of the fans be totalled. Model the addition with place-value number blocks in the same manner as in the earlier lessons of this unit. Stress the three regrouping steps. Point out again how cubes are added first. Record the addition in a place-value chart.

1000s	100s	10s	1s
1	1	1	
4	8	6	3
+2	2	3	9
7	1	0	2

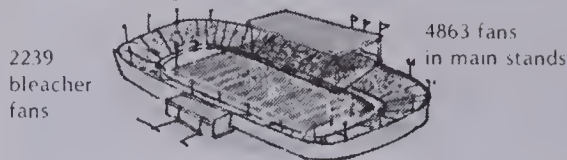
12 ones are regrouped as 1 ten and 2 ones.

10 tens are regrouped as 1 hundred and 0 tens.

11 hundreds are regrouped as 1 thousand and 1 hundred.

Ask the students to model several other similar addition examples.

## Four-Digit Addends



How many fans are at the game?

Add ones.

$$\begin{array}{r} 1 \\ 4863 \\ +2239 \\ \hline 2 \end{array}$$

Add tens.

$$\begin{array}{r} 11 \\ 4863 \\ +2239 \\ \hline 02 \end{array}$$

Add hundreds.

$$\begin{array}{r} 111 \\ 4863 \\ +2239 \\ \hline 102 \end{array}$$

Add thousands.

$$\begin{array}{r} 1111 \\ 4863 \\ +2239 \\ \hline 7102 \end{array}$$

There are 7102 fans at the game.

### EXERCISES

Add

- $\begin{array}{r} 6247 \\ +1743 \\ \hline 7990 \end{array}$
- $\begin{array}{r} 4016 \\ +4978 \\ \hline 8994 \end{array}$
- $\begin{array}{r} 1620 \\ +3291 \\ \hline 4911 \end{array}$
- $\begin{array}{r} 3294 \\ +2291 \\ \hline 5585 \end{array}$
- $\begin{array}{r} 2424 \\ +1925 \\ \hline 4349 \end{array}$
- $\begin{array}{r} 5621 \\ +2099 \\ \hline 7720 \end{array}$
- $\begin{array}{r} 2565 \\ +1506 \\ \hline 4071 \end{array}$
- $\begin{array}{r} 3043 \\ +4258 \\ \hline 7301 \end{array}$
- $\begin{array}{r} 2772 \\ +5266 \\ \hline 8038 \end{array}$
- $\begin{array}{r} 4656 \\ +2517 \\ \hline 7173 \end{array}$
- $\begin{array}{r} 5998 \\ +1123 \\ \hline 7121 \end{array}$
- $\begin{array}{r} 3494 \\ +1729 \\ \hline 5223 \end{array}$
- $\begin{array}{r} 1218 \\ +6782 \\ \hline 8000 \end{array}$
- $\begin{array}{r} 4357 \\ +1948 \\ \hline 6305 \end{array}$
- $\begin{array}{r} 2189 \\ +3946 \\ \hline 6135 \end{array}$
- $\begin{array}{r} 6659 \\ +2452 \\ \hline 9111 \end{array}$
- $\begin{array}{r} 5427 \\ +2673 \\ \hline 8100 \end{array}$
- $\begin{array}{r} 3043 \\ +4959 \\ \hline 8002 \end{array}$
- $\begin{array}{r} 4237 \\ +4985 \\ \hline 9222 \end{array}$
- $\begin{array}{r} 2487 \\ +1655 \\ \hline 4142 \end{array}$
- $\begin{array}{r} 484 \\ +5646 \\ \hline 6130 \end{array}$
- $\begin{array}{r} 121 \\ 3594 \\ +5609 \\ \hline 9324 \end{array}$
- $\begin{array}{r} 204 \\ 788 \\ +585 \\ \hline 1577 \end{array}$
- $\begin{array}{r} 7945 \\ +655 \\ \hline 8600 \end{array}$
- $\begin{array}{r} 1225 \\ +888 \\ \hline 2113 \end{array}$

52

### Using the Exercises

- Questions 1 to 5 require only one regrouping, either in the ones, the tens, or the hundreds place.
- Questions 6 to 10 require up to two regroupings.
- Questions 11 to 25 require up to three regroupings. Several of the problems from this group should be modelled and discussed.

Add

1. 
$$\begin{array}{r} 3768 \\ + 4963 \\ \hline 8731 \end{array}$$
2. 
$$\begin{array}{r} 2949 \\ + 958 \\ \hline 3907 \end{array}$$
3. 
$$\begin{array}{r} 785 \\ + 6427 \\ \hline 7212 \end{array}$$
4. 
$$\begin{array}{r} 3726 \\ + 1996 \\ \hline 5722 \end{array}$$
5. 
$$\begin{array}{r} 586 \\ + 1768 \\ \hline 2354 \end{array}$$
6. 
$$\begin{array}{r} 8563 \\ + 658 \\ \hline 9221 \end{array}$$
7. 
$$\begin{array}{r} 4185 \\ + 4915 \\ \hline 9100 \end{array}$$
8. 
$$\begin{array}{r} 5969 \\ + 3783 \\ \hline 9752 \end{array}$$
9. 
$$\begin{array}{r} 2568 \\ + 2568 \\ \hline 5136 \end{array}$$
10. 
$$\begin{array}{r} 945 \\ + 1479 \\ \hline 2424 \end{array}$$
11. 
$$\begin{array}{r} 1878 \\ + 442 \\ \hline 2320 \end{array}$$
12. 
$$\begin{array}{r} 5119 \\ + 3885 \\ \hline 9004 \end{array}$$
13. 
$$\begin{array}{r} 3338 \\ + 4775 \\ \hline 8113 \end{array}$$
14. 
$$\begin{array}{r} 4368 \\ + 632 \\ \hline 5000 \end{array}$$
15. 
$$\begin{array}{r} 3669 \\ + 1872 \\ \hline 5541 \end{array}$$

Solve

16. A crowd of 2234 people watched the first day of a tennis tournament. The next day, a sell-out crowd of 3978 attended the matches. How many fans watched the two days of tennis? **6212**
17. The food stand at a baseball game sold 1256 boxes of buttered popcorn and 958 boxes of plain popcorn during a doubleheader. How many boxes of popcorn were sold in all? **2214**

## Back to Front

Some numbers read the same from right to left and from left to right

121

55

1881

Take any whole number

Reverse the digits

Add.

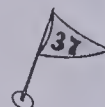
Does the sum read the same backward and forward?

If not, repeat the steps.

Keep doing this until the sum reads the same backward and forward



$$\begin{array}{r} 24 \\ + 42 \\ \hline 66 \end{array}$$



$$\begin{array}{r} 37 \\ + 73 \\ \hline 110 \\ + 011 \\ \hline 121 \end{array}$$

Can you find a number that does not do this?

53

## Extra Practice

Rewrite as thousands and hundreds.

1. 13 hundreds = 1 thousand + 3 hundreds
2. 43 hundreds = 4 thousands + 3 hundreds

Add.

3. 
$$\begin{array}{r} 836 \\ + 179 \\ \hline 1015 \end{array}$$
4. 
$$\begin{array}{r} 6237 \\ + 2894 \\ \hline 9131 \end{array}$$
5. 
$$\begin{array}{r} 6065 \\ + 958 \\ \hline 7023 \end{array}$$
6. 
$$\begin{array}{r} 3384 \\ + 1996 \\ \hline 5380 \end{array}$$
7. 
$$\begin{array}{r} 2855 \\ + 5149 \\ \hline 8004 \end{array}$$
8. 
$$\begin{array}{r} 586 \\ + 8709 \\ \hline 9295 \end{array}$$
9. 
$$\begin{array}{r} 6235 \\ + 2894 \\ \hline 9129 \end{array}$$
10. 
$$\begin{array}{r} 5359 \\ + 3848 \\ \hline 9207 \end{array}$$

Solve.

11. During his baseball career, Stan had 1988 hits, 5432 outs, and 857 walks. How many times was he at bat? **8277**

## Assigning the Practice

Minimum: 1-10, 16, 17

Average: 6-17

Enriched: 6-17

## Reinforcement

1. Make a "Concentration" game of 20 cards. Have ten cards showing various amounts of hundreds and ten cards with matching amounts of thousands and hundreds.

43 hundreds

4 thousands  
and  
3 hundreds

29 hundreds

2 thousands  
and  
9 hundreds

The cards are spread out face down. The player turns two cards over looking for a match. If no match is found, the turn is over. Players keep all the matches they find. The winner holds the most matches.

2. Prepare the following worksheet which asks the students to find the balloon with the largest sum.



## Enrichment

1. Most students will be able to find some palindromic sums (those in which the digits read the same forward and backward) as required in *Back to Front*, page 53. However, the addition of such numbers can soon involve relatively large sums. These may require regrouping beyond thousands which has not yet been formally taught.
2. Ask the students to fill in the missing numbers in these addition questions.

$$\begin{array}{r} 3784 \\ + 1\blacksquare2\blacksquare \\ \hline \blacksquare713 \end{array}$$

$$\begin{array}{r} 4\blacksquare19 \\ + \blacksquare58\blacksquare \\ \hline 50\blacksquare2 \end{array}$$

$$\begin{array}{r} 8\blacksquare7\blacksquare \\ + \blacksquare9\blacksquare8 \\ \hline 13140 \end{array}$$

# UNIT 3 LESSON 5

## Objective A13

Subtract two-digit numbers, regroup tens.

### Introducing the Lesson

Reverse the regrouping process used in addition. Model the number 23 with place-value blocks, showing how 2 tens and 3 ones is the same as 1 ten and 13 ones.



Record this regrouping in the following chalkboard charts.

10s	1s		10s	1s
2	3	=	1	13

or,  $\begin{array}{r} 1\ 13 \\ - 2\ 3 \\ \hline \end{array}$

Model and record the regrouping of several other two-digit numbers.

### Teaching the Lesson

Read and discuss the problem presented at the top of page 54. Model the required subtraction with number blocks. Note how subtraction starts with the cubes.

Take 4 rods and 8 cubes from:



Subtract the cubes.

Since there are not enough cubes, regroup 1 rod as 10 cubes.



Now subtract 4 rods and 8 cubes. 1 rod and 6 cubes are left.

Record the subtraction in a place-value chart.

10s	1s
5	13
<del>4</del>	<del>8</del>
1	6

Explain that the answer in a subtraction is called the **difference**. The home team scored 64 points and the visitors scored 48. The difference in their scores was 16 points.

## Two-Place Subtraction

Home Visitors

64

48

By how many points did our team win?

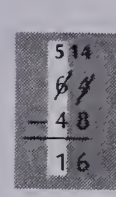
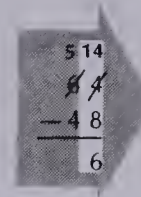
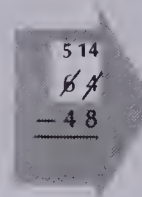
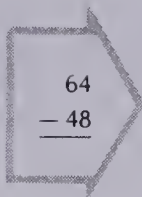


Write the question.

Regroup tens and ones.

Subtract ones.

Subtract tens.



Our team won by 16 points.

### EXERCISES

Subtract.

- $\begin{array}{r} 14 \\ - 6 \\ \hline 8 \end{array}$
- $\begin{array}{r} 24 \\ - 6 \\ \hline 18 \end{array}$
- $\begin{array}{r} 24 \\ - 16 \\ \hline 8 \end{array}$
- $\begin{array}{r} 34 \\ - 16 \\ \hline 18 \end{array}$
- $\begin{array}{r} 44 \\ - 26 \\ \hline 18 \end{array}$
- $\begin{array}{r} 18 \\ - 9 \\ \hline 9 \end{array}$
- $\begin{array}{r} 28 \\ - 9 \\ \hline 19 \end{array}$
- $\begin{array}{r} 28 \\ - 19 \\ \hline 9 \end{array}$
- $\begin{array}{r} 38 \\ - 19 \\ \hline 19 \end{array}$
- $\begin{array}{r} 58 \\ - 19 \\ \hline 39 \end{array}$
- $\begin{array}{r} 16 \\ - 7 \\ \hline 9 \end{array}$
- $\begin{array}{r} 56 \\ - 7 \\ \hline 49 \end{array}$
- $\begin{array}{r} 56 \\ - 37 \\ \hline 19 \end{array}$
- $\begin{array}{r} 13 \\ - 8 \\ \hline 5 \end{array}$
- $\begin{array}{r} 43 \\ - 28 \\ \hline 15 \end{array}$
- $\begin{array}{r} 94 \\ - 26 \\ \hline 68 \end{array}$
- $\begin{array}{r} 42 \\ - 18 \\ \hline 24 \end{array}$
- $\begin{array}{r} 76 \\ - 29 \\ \hline 47 \end{array}$
- $\begin{array}{r} 53 \\ - 27 \\ \hline 26 \end{array}$
- $\begin{array}{r} 85 \\ - 15 \\ \hline 70 \end{array}$
- $\begin{array}{r} 65 \\ - 39 \\ \hline 26 \end{array}$
- $\begin{array}{r} 88 \\ - 49 \\ \hline 39 \end{array}$
- $\begin{array}{r} 40 \\ - 24 \\ \hline 16 \end{array}$
- $\begin{array}{r} 52 \\ - 48 \\ \hline 4 \end{array}$
- $\begin{array}{r} 80 \\ - 53 \\ \hline 27 \end{array}$

54

### Using the Exercises

- Each set of questions (1 to 5, 6 to 10, and 11 to 15) has the same ones digits yet they progress from a basic fact (Objectives A1 and A2), to one-digit from two-digits (Objective A7), to two-digits from two-digits. The students learn the objective of this lesson by proceeding from skills already mastered.
- The remaining exercises provide mixed practice, including some examples involving zero in the ones place. Watch for problems and provide assistance when necessary.



## PRACTICE

Find the difference.

1.  $\begin{array}{r} 73 \\ - 39 \\ \hline 34 \end{array}$
2.  $\begin{array}{r} 31 \\ - 19 \\ \hline 12 \end{array}$
3.  $\begin{array}{r} 22 \\ - 4 \\ \hline 18 \end{array}$
4.  $\begin{array}{r} 91 \\ - 18 \\ \hline 73 \end{array}$
5.  $\begin{array}{r} 88 \\ - 49 \\ \hline 39 \end{array}$
6.  $\begin{array}{r} 55 \\ - 29 \\ \hline 26 \end{array}$
7.  $\begin{array}{r} 97 \\ - 68 \\ \hline 29 \end{array}$
8.  $\begin{array}{r} 34 \\ - 9 \\ \hline 25 \end{array}$
9.  $\begin{array}{r} 85 \\ - 36 \\ \hline 49 \end{array}$
10.  $\begin{array}{r} 92 \\ - 27 \\ \hline 65 \end{array}$
11.  $\begin{array}{r} 62 \\ - 35 \\ \hline 27 \end{array}$
12.  $\begin{array}{r} 83 \\ - 28 \\ \hline 55 \end{array}$
13.  $\begin{array}{r} 81 \\ - 72 \\ \hline 9 \end{array}$
14.  $\begin{array}{r} 90 \\ - 54 \\ \hline 36 \end{array}$
15.  $\begin{array}{r} 52 \\ - 8 \\ \hline 44 \end{array}$

Solve.

16. The final score in a basketball game was 83 to 67. How many more points did the winners score than the losers? **16**
17. The girls' team beat the boys' team in softball by a score of 22 to 14. By how many points did the girls' team win? **8**

## REVIEW

Add.

- |     |  |  |   |   |  |
|-----|--|--|---|---|--|
| A9  | 1. $\begin{array}{r} 58 \\ + 32 \\ \hline 90 \end{array}$        | 2. $\begin{array}{r} 16 \\ + 5 \\ \hline 21 \end{array}$         | 3. $\begin{array}{r} 44 \\ + 29 \\ \hline 73 \end{array}$       | 4. $\begin{array}{r} 133 \\ + 247 \\ \hline 380 \end{array}$    | 5. $\begin{array}{r} 386 \\ + 9 \\ \hline 395 \end{array}$       |
| A10 | 6. $\begin{array}{r} 671 \\ + 236 \\ \hline 907 \end{array}$     | 7. $\begin{array}{r} 550 \\ + 290 \\ \hline 840 \end{array}$     | 8. $\begin{array}{r} 135 \\ + 82 \\ \hline 217 \end{array}$     | 9. $\begin{array}{r} 366 \\ + 252 \\ \hline 618 \end{array}$    | 10. $\begin{array}{r} 292 \\ + 46 \\ \hline 338 \end{array}$     |
| A11 | 11. $\begin{array}{r} 185 \\ + 377 \\ \hline 562 \end{array}$    | 12. $\begin{array}{r} 726 \\ + 199 \\ \hline 925 \end{array}$    | 13. $\begin{array}{r} 434 \\ + 98 \\ \hline 532 \end{array}$    | 14. $\begin{array}{r} 512 \\ + 88 \\ \hline 600 \end{array}$    | 15. $\begin{array}{r} 675 \\ + 125 \\ \hline 800 \end{array}$    |
| A12 | 16. $\begin{array}{r} 2468 \\ + 4753 \\ \hline 7221 \end{array}$ | 17. $\begin{array}{r} 3694 \\ + 3826 \\ \hline 7520 \end{array}$ | 18. $\begin{array}{r} 5395 \\ + 607 \\ \hline 6002 \end{array}$ | 19. $\begin{array}{r} 8268 \\ + 759 \\ \hline 9027 \end{array}$ | 20. $\begin{array}{r} 6582 \\ + 1929 \\ \hline 8511 \end{array}$ |

55

## Assigning the Practice

Minimum: 1-5, 16, 17

Average: 6-10, 16, 17

Enriched: 11-17

## Review Exercises

Questions	Objective	Pages
1-5	A9	46-47
6-10	A10	48-49
11-15	A11	50-51
16-20	A12	52-53

## Reinforcement

1. It is necessary to recall facts quickly. Have pupils practise building up speed with a flash card drill of the basic subtraction facts.

2. Create a "Snap" card game for two players. Make 30 cards with the basic subtraction facts. Place the deck of cards face down. Player A turns up the top card. The first one of the players to call out the correct answer to the question may keep the card. Player B turns up the next top card and the procedure is repeated. When the cards in the deck all have been turned up, the player with the most cards is the winner.

## Enrichment

1. Using a newspaper sports page, have the students devise work cards involving the addition and subtraction of actual scores. Encourage them to draw a picture of the sport. Display the results for the rest of the class to solve.

Shots on goal:

Canadians 37

Maple Leafs 41

How many more shots did the Maple Leafs have?

2. Provide mental subtraction practice using the following kind of examples.

$\begin{array}{r} 46 \\ - 9 \\ \hline \end{array}$	$\begin{array}{r} 91 \\ - 7 \\ \hline \end{array}$	$\begin{array}{r} 65 \\ - 8 \\ \hline \end{array}$	$\begin{array}{r} 52 \\ - 6 \\ \hline \end{array}$
--	--	--	--

## Extra Practice

Complete.

1. 8 tens = 7 tens + 10 ones
2. 5 tens = 4 tens + 10 ones
3. 3 tens + 4 ones = 2 tens + 14 ones
4. 4 tens + 8 ones = 3 tens + 18 ones

Subtract.

5.  $\begin{array}{r} 52 \\ - 19 \\ \hline 33 \end{array}$
6.  $\begin{array}{r} 36 \\ - 7 \\ \hline 29 \end{array}$
7.  $\begin{array}{r} 95 \\ - 48 \\ \hline 47 \end{array}$
8.  $\begin{array}{r} 61 \\ - 44 \\ \hline 17 \end{array}$
9.  $\begin{array}{r} 23 \\ - 15 \\ \hline 8 \end{array}$
10.  $\begin{array}{r} 69 \\ - 58 \\ \hline 11 \end{array}$
11.  $\begin{array}{r} 47 \\ - 18 \\ \hline 29 \end{array}$
12.  $\begin{array}{r} 92 \\ - 36 \\ \hline 56 \end{array}$
13.  $\begin{array}{r} 84 \\ - 57 \\ \hline 27 \end{array}$
14.  $\begin{array}{r} 35 \\ - 26 \\ \hline 9 \end{array}$

Solve.

15. During the bareback-riding contest at the rodeo, Mel scored 81 points for his ride on Warpath. Jim scored 73 points for his ride on Scooter. By how many points did Mel win? **8**

## Worksheet A13

Page 54-55

UNIT 3 LESSON 6

Objective A14

Subtract three-digit numbers, regroup tens.

Introducing the Lesson

Refer the class to the school marathon on page 56. Begin a discussion of marathons. Have the students relate what they know about them. Talk about the possibility of having a marathon race in your own school.

Teaching the Lesson

Read and discuss the problem at the top of page 56. Model the subtraction required with place-value number blocks. Record the algorithm in a place-value chart.

Take 1 flat, 5 rods, and 6 cubes away from:



Subtract cubes first. Since there are not enough cubes, regroup 1 rod as 10 cubes.

Subtract 1 flat, 5 rods, and 6 cubes.

3 flats, 2 rods, and 6 cubes remain.

100s	10s	1s
4	<del>8</del>	<del>2</del>
-1	5	6
3	2	6

Try several other three-place subtraction examples such as the following.

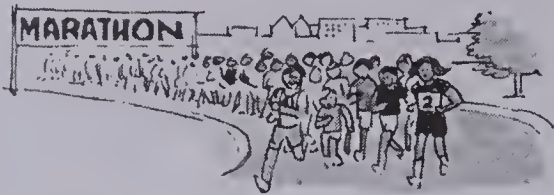
a. Greg scored 149 runs one season and 251 runs the next season for his baseball team. How many more runs did he score the second season?

$$\begin{array}{r} 251 \text{ second season} \\ -149 \text{ first season} \\ \hline 102 \end{array}$$

b. There were 871 students and 436 adults at a high school basketball game. How many more students attended the game?

$$\begin{array}{r} 871 \text{ students} \\ -436 \text{ adults} \\ \hline 435 \end{array}$$

Three-Place Subtraction



482 boys  
156 girls

How many more boys?

Regroup tens  
and ones

$$\begin{array}{r} 712 \\ -156 \\ \hline \end{array}$$

Subtract  
ones

$$\begin{array}{r} 712 \\ -156 \\ \hline 6 \end{array}$$

Subtract  
tens

$$\begin{array}{r} 712 \\ -156 \\ \hline 26 \end{array}$$

Subtract  
hundreds

$$\begin{array}{r} 712 \\ -156 \\ \hline 326 \end{array}$$

There were 326 more boys than girls.

EXERCISES

Subtract.

- |  |  |  |  |  |
|--|--|--|--|--|
| 1. $\begin{array}{r} 12 \\ -4 \\ \hline 8 \end{array}$       | 2. $\begin{array}{r} 62 \\ -14 \\ \hline 48 \end{array}$     | 3. $\begin{array}{r} 762 \\ -114 \\ \hline 648 \end{array}$  | 4. $\begin{array}{r} 15 \\ -6 \\ \hline 9 \end{array}$       | 5. $\begin{array}{r} 45 \\ -16 \\ \hline 29 \end{array}$     |
| 6. $\begin{array}{r} 845 \\ -216 \\ \hline 629 \end{array}$  | 7. $\begin{array}{r} 16 \\ -9 \\ \hline 7 \end{array}$       | 8. $\begin{array}{r} 56 \\ -39 \\ \hline 17 \end{array}$     | 9. $\begin{array}{r} 756 \\ -339 \\ \hline 417 \end{array}$  | 10. $\begin{array}{r} 336 \\ -119 \\ \hline 217 \end{array}$ |
| 11. $\begin{array}{r} 715 \\ -209 \\ \hline 506 \end{array}$ | 12. $\begin{array}{r} 523 \\ -207 \\ \hline 316 \end{array}$ | 13. $\begin{array}{r} 853 \\ -646 \\ \hline 207 \end{array}$ | 14. $\begin{array}{r} 597 \\ -169 \\ \hline 428 \end{array}$ | 15. $\begin{array}{r} 543 \\ -227 \\ \hline 316 \end{array}$ |
| 16. $\begin{array}{r} 916 \\ -607 \\ \hline 309 \end{array}$ | 17. $\begin{array}{r} 250 \\ -139 \\ \hline 111 \end{array}$ | 18. $\begin{array}{r} 996 \\ -88 \\ \hline 908 \end{array}$  | 19. $\begin{array}{r} 520 \\ -405 \\ \hline 115 \end{array}$ | 20. $\begin{array}{r} 492 \\ -69 \\ \hline 423 \end{array}$  |
| 21. $\begin{array}{r} 945 \\ -529 \\ \hline 416 \end{array}$ | 22. $\begin{array}{r} 650 \\ -418 \\ \hline 232 \end{array}$ | 23. $\begin{array}{r} 743 \\ -115 \\ \hline 628 \end{array}$ | 24. $\begin{array}{r} 861 \\ -833 \\ \hline 28 \end{array}$  | 25. $\begin{array}{r} 492 \\ -57 \\ \hline 435 \end{array}$  |

Using the Exercises

- Questions 1 to 3, 4 to 6, and 7 to 10 proceed from basic facts to three-place subtraction involving the same ones digits.
- Questions 11 to 25 provide mixed practice including examples involving zero. Watch for difficulties and provide individual help when necessary.

## PRACTICE

Find the difference.

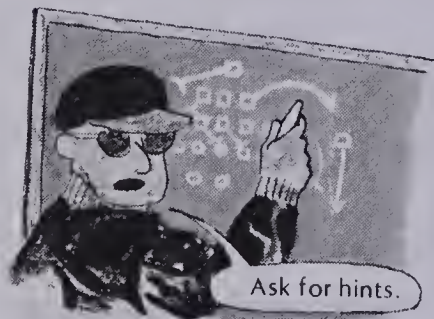
1.  $\begin{array}{r} 361 \\ -146 \\ \hline 215 \end{array}$
2.  $\begin{array}{r} 791 \\ -424 \\ \hline 367 \end{array}$
3.  $\begin{array}{r} 272 \\ -15 \\ \hline 257 \end{array}$
4.  $\begin{array}{r} 374 \\ -347 \\ \hline 27 \end{array}$
5.  $\begin{array}{r} 833 \\ -515 \\ \hline 318 \end{array}$
6.  $\begin{array}{r} 843 \\ -626 \\ \hline 217 \end{array}$
7.  $\begin{array}{r} 992 \\ -48 \\ \hline 944 \end{array}$
8.  $\begin{array}{r} 796 \\ -389 \\ \hline 407 \end{array}$
9.  $\begin{array}{r} 480 \\ -56 \\ \hline 424 \end{array}$
10.  $\begin{array}{r} 372 \\ -45 \\ \hline 327 \end{array}$
11.  $\begin{array}{r} 185 \\ -148 \\ \hline 37 \end{array}$
12.  $\begin{array}{r} 560 \\ -126 \\ \hline 434 \end{array}$
13.  $\begin{array}{r} 641 \\ -622 \\ \hline 19 \end{array}$
14.  $\begin{array}{r} 470 \\ -41 \\ \hline 429 \end{array}$
15.  $\begin{array}{r} 593 \\ -65 \\ \hline 528 \end{array}$

Solve.

16. Greg won a springboard diving contest. He scored 352 points. The second place finisher scored 328 points. By how many points did Greg win the competition? **24**
17. The score of a perfect game in 5-pin bowling is 450. Carla rolled a 326 game. How many points less than a perfect game did she score? **124**

## What Comes Next?

Can you continue these patterns?  
What is the rule for each pattern?



- (a) 73, 63, 53, 43, <sup>33 23 13</sup>  $\square$ ,  $\square$ ,  $\square$ , 3
  - (b) 2, 2, 4, 6, 10, 16, <sup>26 42 68</sup>  $\square$ ,  $\square$ ,  $\square$ , 110
  - (c) 100, 91, 83, 76, <sup>70 65 61</sup>  $\square$ ,  $\square$ ,  $\square$ , 58
  - (d) 9, 8, 10, 9, 11, 10, <sup>12 11 13</sup>  $\square$ ,  $\square$ ,  $\square$ , 12
  - (e) 200, 136, 104, 88, <sup>80 76 74</sup>  $\square$ ,  $\square$ ,  $\square$ , 73
  - (f) 100, 81, 64, 49, <sup>36 25 16</sup>  $\square$ ,  $\square$ ,  $\square$ , 9
  - (g) 5, 10, 20, 40, <sup>80 160 320</sup>  $\square$ ,  $\square$ ,  $\square$ , 640
  - (h) F, S, T, F, F, S, <sup>S E N</sup>  $\square$ ,  $\square$ ,  $\square$ , T, E, T
- First, Second, Third etc.** 57

## Assigning the Practice

Minimum: 1-5, 16, 17  
Average: 6-10, 16, 17  
Enriched: 11-17

## Reinforcement

1. Present the students with their own copies of the puzzle below. Their instructions are to write in each blank triangle the difference between the numbers in the two triangles on either side.

641		322		118
885		456		329
653		345		226
880		561		124

2. Provide the following subtraction table for a review of the basic subtraction facts.

-	8	4	7	5	9	6	3
13							
16							
10							
18							
17							
14							
11							
15							
12							

## Enrichment

The sequences in *What Comes Next?* page 57, are rather difficult and will be enjoyed most by students with "number sense".

## Extra Practice

## Worksheet A14

Pages 56-57

Subtract.

1.  $\begin{array}{r} 284 \\ -119 \\ \hline 165 \end{array}$
2.  $\begin{array}{r} 591 \\ -375 \\ \hline 216 \end{array}$
3.  $\begin{array}{r} 693 \\ -56 \\ \hline 637 \end{array}$
4.  $\begin{array}{r} 353 \\ -144 \\ \hline 209 \end{array}$
5.  $\begin{array}{r} 287 \\ -119 \\ \hline 168 \end{array}$
6.  $\begin{array}{r} 325 \\ -206 \\ \hline 119 \end{array}$
7.  $\begin{array}{r} 285 \\ -218 \\ \hline 67 \end{array}$
8.  $\begin{array}{r} 594 \\ -87 \\ \hline 507 \end{array}$
9.  $\begin{array}{r} 653 \\ -241 \\ \hline 412 \end{array}$
10.  $\begin{array}{r} 891 \\ -246 \\ \hline 645 \end{array}$
11.  $\begin{array}{r} 355 \\ -28 \\ \hline 327 \end{array}$
12.  $\begin{array}{r} 684 \\ -62 \\ \hline 622 \end{array}$
13.  $\begin{array}{r} 735 \\ -517 \\ \hline 218 \end{array}$
14.  $\begin{array}{r} 212 \\ -9 \\ \hline 203 \end{array}$
15.  $\begin{array}{r} 655 \\ -337 \\ \hline 318 \end{array}$

Solve.

16. During the hockey season, Wayne scored 132 points. Marcel scored 119 points. How many more points did Wayne score? **13**



# UNIT 3 LESSON 7

## Objective A15

Subtract three-digit numbers, regroup tens and hundreds.

### Introducing the Lesson

Review the *regrouping of tens* studied thus far with place-value blocks.

100s	10s	1s
2	4	2
2	3	12

or,  $\begin{array}{r} 3\ 12 \\ - 2\ 42 \\ \hline \end{array}$

"One ten was traded for ten ones."

### Teaching the Lesson

Model the *regrouping of tens and hundreds* with place-value blocks.

100s	10s	1s
2	2	3

a. Regroup tens.

100s	10s	1s
2	1	13

or,  $\begin{array}{r} 1\ 13 \\ - 2\ 23 \\ \hline \end{array}$

"One ten was traded for ten ones."

b. Regroup hundreds.

100s	10s	1s
1	11	13

or,  $\begin{array}{r} 1\ 11\ 13 \\ - 2\ 23 \\ \hline \end{array}$

"One hundred was traded for ten tens."

Try several other similar examples.

Develop the lesson problem on page 58 at the chalkboard. Ask the students to model and explain the regrouping steps.

Provide practice with several other similar examples. Be sure to discuss and demonstrate regrouping when the minuend contains one or more zeros. A zero in the ones place is relatively simple. However, a zero in the tens place necessitates two-step regrouping and requires careful explanation.

$$\begin{array}{r} 5\ 10 \\ 8\ 0\ 0 \\ - 3\ 2\ 7 \\ \hline \end{array}$$

"One hundred traded for ten tens."

$$\begin{array}{r} 9 \\ 5\ 10\ 10 \\ 8\ 0\ 0 \\ - 3\ 2\ 7 \\ \hline \end{array}$$

"One ten traded for ten ones."

## Regrouping Hundreds



First day 321 laps Second day 158 laps

How many more laps on the first day?

Regroup tens and ones.

$$\begin{array}{r} 1\ 11 \\ 3\ 2\ 1 \\ - 1\ 5\ 8 \\ \hline \end{array}$$

Subtract ones.

$$\begin{array}{r} 1\ 11 \\ 3\ 2\ 1 \\ - 1\ 5\ 8 \\ \hline 3 \end{array}$$

Regroup. Subtract tens.

$$\begin{array}{r} 2\ 11\ 11 \\ 3\ 2\ 1 \\ - 1\ 5\ 8 \\ \hline 6\ 3 \end{array}$$

Subtract hundreds.

$$\begin{array}{r} 2\ 11\ 11 \\ 3\ 2\ 1 \\ - 1\ 5\ 8 \\ \hline 1\ 6\ 3 \end{array}$$

The car did 163 more laps on the first day.

### EXERCISES

Subtract.

- $\begin{array}{r} 953 \\ - 328 \\ \hline 625 \end{array}$
- $\begin{array}{r} 343 \\ - 214 \\ \hline 129 \end{array}$
- $\begin{array}{r} 685 \\ - 466 \\ \hline 219 \end{array}$
- $\begin{array}{r} 374 \\ - 158 \\ \hline 216 \end{array}$
- $\begin{array}{r} 887 \\ - 339 \\ \hline 548 \end{array}$
- $\begin{array}{r} 642 \\ - 351 \\ \hline 291 \end{array}$
- $\begin{array}{r} 524 \\ - 342 \\ \hline 182 \end{array}$
- $\begin{array}{r} 962 \\ - 170 \\ \hline 792 \end{array}$
- $\begin{array}{r} 585 \\ - 294 \\ \hline 291 \end{array}$
- $\begin{array}{r} 737 \\ - 283 \\ \hline 454 \end{array}$
- $\begin{array}{r} 278 \\ - 199 \\ \hline 79 \end{array}$
- $\begin{array}{r} 456 \\ - 358 \\ \hline 98 \end{array}$
- $\begin{array}{r} 915 \\ - 358 \\ \hline 557 \end{array}$
- $\begin{array}{r} 581 \\ - 298 \\ \hline 283 \end{array}$
- $\begin{array}{r} 894 \\ - 685 \\ \hline 209 \end{array}$
- $\begin{array}{r} 711 \\ - 632 \\ \hline 79 \end{array}$
- $\begin{array}{r} 502 \\ - 155 \\ \hline 347 \end{array}$
- $\begin{array}{r} 953 \\ - 584 \\ \hline 369 \end{array}$
- $\begin{array}{r} 801 \\ - 444 \\ \hline 357 \end{array}$
- $\begin{array}{r} 612 \\ - 208 \\ \hline 404 \end{array}$
- $\begin{array}{r} 410 \\ - 257 \\ \hline 153 \end{array}$
- $\begin{array}{r} 813 \\ - 95 \\ \hline 718 \end{array}$
- $\begin{array}{r} 200 \\ - 77 \\ \hline 123 \end{array}$
- $\begin{array}{r} 541 \\ - 479 \\ \hline 62 \end{array}$
- $\begin{array}{r} 600 \\ - 489 \\ \hline 111 \end{array}$

### Using the Exercises

- Questions 1 to 5 involve regrouping tens only.
- Questions 6 to 10 involve regrouping hundreds only.
- Questions 11 to 15 involve regrouping tens and hundreds.
- Questions 16 to 25 also involve zeros. Special attention should be given to any regrouping difficulties that appear here.

## PRACTICE

Write the difference.

- |   |   |   |   |  |
|---|---|---|---|--|
| 1. $\begin{array}{r} 424 \\ - 395 \\ \hline 29 \end{array}$   | 2. $\begin{array}{r} 258 \\ - 189 \\ \hline 69 \end{array}$   | 3. $\begin{array}{r} 344 \\ - 186 \\ \hline 158 \end{array}$  | 4. $\begin{array}{r} 633 \\ - 288 \\ \hline 345 \end{array}$  | 5. $\begin{array}{r} 725 \\ - 148 \\ \hline 577 \end{array}$ |
| 6. $\begin{array}{r} 521 \\ - 432 \\ \hline 89 \end{array}$   | 7. $\begin{array}{r} 980 \\ - 583 \\ \hline 397 \end{array}$  | 8. $\begin{array}{r} 327 \\ - 98 \\ \hline 229 \end{array}$   | 9. $\begin{array}{r} 530 \\ - 234 \\ \hline 296 \end{array}$  | 10. $\begin{array}{r} 754 \\ - 66 \\ \hline 688 \end{array}$ |
| 11. $\begin{array}{r} 300 \\ - 114 \\ \hline 186 \end{array}$ | 12. $\begin{array}{r} 762 \\ - 565 \\ \hline 197 \end{array}$ | 13. $\begin{array}{r} 604 \\ - 312 \\ \hline 292 \end{array}$ | 14. $\begin{array}{r} 920 \\ - 336 \\ \hline 584 \end{array}$ | 15. $\begin{array}{r} 205 \\ - 98 \\ \hline 107 \end{array}$ |

Solve.

16. Students trained for a race during noon hour each day for one week. The members of the Red team ran a total of 258 laps and the Green team 302 laps. How many more laps did the Green team run? 44
17. In the saddle bronc competition, Joe scored 76 and 67 points on his two rides. Mel scored 79 points on his first ride. How many points does Mel have to score to beat Joe? At least 65

## A Surprise Ending

Start with any four whole numbers, for example, 32, 47, 10, and 5.

Find the difference between the first and second numbers, the second and third, the third and the fourth, and the fourth and the first.

Continue subtracting this way as long as you can.

32      47      10      5      32  
 15      37      5      27      15  
 22      32      22      12

59

## Assigning the Practice

Minimum: 1-17

Average: 1-17

Enriched: 1-17

## Reinforcement

1. Label two blank cubes as follows: first cube—900, 908, 984, 970, 903, 943; second cube—199, 367, 428, 705, 293, 170.

Tell the students that they are to subtract the smaller number that they roll from the larger number. Have them record each subtraction on paper.

2. Provide a worksheet with the following kinds of questions.

- 7 hundreds = 6 hundreds, \_\_\_\_ tens
- 8 hundreds = \_\_\_\_ hundreds, 10 tens
- 3 hundreds, 16 tens = \_\_\_\_ hundreds 16 tens
- 5 hundreds, 8 tens = 4 hundreds, \_\_\_\_ tens
- 2 hundreds, 5 tens, 3 ones = 2 hundreds, 4 tens, \_\_\_\_ ones = 1 hundred, \_\_\_\_ tens, \_\_\_\_ ones
- 5 hundreds, 0 tens, 2 ones = 4 hundreds, \_\_\_\_ tens, 2 ones = 4 hundreds, \_\_\_\_ tens, 12 ones

## Enrichment

A *Surprise Ending*, page 59, does not require skills other than those taught in this lesson, as long as the chosen numbers are restricted to two digits. All students should be able to do some examples of this type.

## Extra Practice

Regroup.

- 5 hundreds = 4 hundreds + 10 tens
- 3 hundreds + 3 tens = 2 hundreds + 13 tens
- 7 hundreds + 6 tens = 75 tens + 10 ones

Subtract.

- |  |   |   |   |   |
|--|---|---|---|---|
| 4. $\begin{array}{r} 400 \\ - 156 \\ \hline 244 \end{array}$ | 5. $\begin{array}{r} 600 \\ - 287 \\ \hline 313 \end{array}$  | 6. $\begin{array}{r} 300 \\ - 76 \\ \hline 224 \end{array}$   | 7. $\begin{array}{r} 500 \\ - 325 \\ \hline 175 \end{array}$  | 8. $\begin{array}{r} 704 \\ - 326 \\ \hline 378 \end{array}$  |
| 9. $\begin{array}{r} 808 \\ - 219 \\ \hline 589 \end{array}$ | 10. $\begin{array}{r} 406 \\ - 257 \\ \hline 149 \end{array}$ | 11. $\begin{array}{r} 205 \\ - 68 \\ \hline 137 \end{array}$  | 12. $\begin{array}{r} 230 \\ - 115 \\ \hline 115 \end{array}$ | 13. $\begin{array}{r} 648 \\ - 269 \\ \hline 379 \end{array}$ |
| 14. $\begin{array}{r} 207 \\ - 191 \\ \hline 16 \end{array}$ | 15. $\begin{array}{r} 845 \\ - 417 \\ \hline 428 \end{array}$ | 16. $\begin{array}{r} 432 \\ - 245 \\ \hline 187 \end{array}$ | 17. $\begin{array}{r} 861 \\ - 777 \\ \hline 84 \end{array}$  | 18. $\begin{array}{r} 650 \\ - 83 \\ \hline 567 \end{array}$  |

## Worksheet A15

Pages 58-59

UNIT 3 LESSON 8

Objective A16

Subtract four-digit numbers, regroup tens, hundreds, and thousands.

Introducing the Lesson

Talk about the sport of cycling and cycle racing. Have the students relate their experiences with cycle trips and/or races.

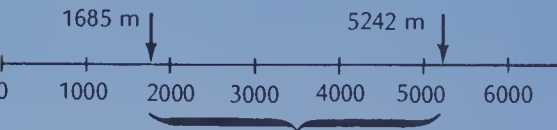
Teaching the Lesson

Point out the cycling race at the top of page 60. "How far have the cyclists gone?" 1685 m "How far have they yet to go?" Point out how one has to find the **difference** between 1685 m and 5242 m.

Model the subtraction with number blocks as in lessons 5, 6, and 7. Emphasize the three regrouping steps. Note, also, that the subtracting process begins with the ones. Record the algorithm in a place-value chart.

1000s	100s	10s	1s
4	11	13	12
<del>4</del>	<del>11</del>	<del>13</del>	<del>12</del>
-1	6	8	5
3	5	5	7

Point out the remaining distance on a number line.



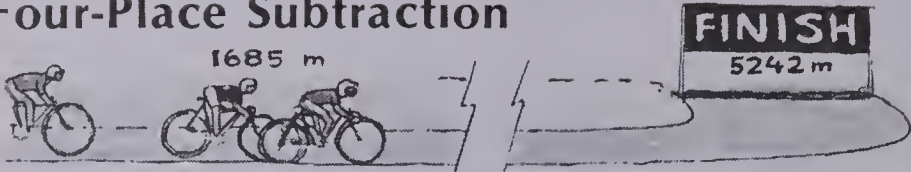
The remaining distance is 3557 m.

Practise several other examples, especially problems having zero in the minuend.

$$\begin{array}{r} 9 \\ 5 \cancel{7} \cancel{0} 1110 \\ \phantom{0} \cancel{5} \cancel{0} \cancel{2} \phantom{0} \\ - 3737 \\ \hline 2283 \end{array}$$

$$\begin{array}{r} 99 \\ 4 \cancel{7} \cancel{0} \cancel{1} 0 \\ \phantom{0} \cancel{5} \cancel{0} \cancel{0} \phantom{0} \\ - 2136 \\ \hline 2864 \end{array}$$

Four-Place Subtraction



Regroup  
Subtract  
ones.

$$\begin{array}{r} 312 \\ 52\cancel{4}\cancel{2} \\ - 1685 \\ \hline 7 \end{array}$$

Regroup  
Subtract  
tens.

$$\begin{array}{r} 11312 \\ 5\cancel{2}\cancel{4}\cancel{2} \\ - 1685 \\ \hline 57 \end{array}$$

Regroup  
Subtract  
hundreds

$$\begin{array}{r} 4111312 \\ \cancel{5}\cancel{2}\cancel{4}\cancel{2} \\ - 1685 \\ \hline 557 \end{array}$$

Subtract  
thousands

$$\begin{array}{r} 4111312 \\ \cancel{5}\cancel{2}\cancel{4}\cancel{2} \\ - 1685 \\ \hline 3557 \end{array}$$

There are 3557 m left in the race.

EXERCISES

Subtract.

1.  $\begin{array}{r} 7288 \\ - 5482 \\ \hline 1806 \end{array}$

6.  $\begin{array}{r} 9236 \\ - 6394 \\ \hline 2842 \end{array}$

11.  $\begin{array}{r} 4382 \\ - 2693 \\ \hline 1689 \end{array}$

16.  $\begin{array}{r} 5051 \\ - 3264 \\ \hline 1787 \end{array}$

21.  $\begin{array}{r} 2300 \\ - 1811 \\ \hline 489 \end{array}$
2.  $\begin{array}{r} 5465 \\ - 2813 \\ \hline 2652 \end{array}$

7.  $\begin{array}{r} 2848 \\ - 1865 \\ \hline 983 \end{array}$

12.  $\begin{array}{r} 5271 \\ - 1893 \\ \hline 3378 \end{array}$

17.  $\begin{array}{r} 8543 \\ - 6889 \\ \hline 1654 \end{array}$

22.  $\begin{array}{r} 6080 \\ - 4281 \\ \hline 1799 \end{array}$
3.  $\begin{array}{r} 4632 \\ - 1911 \\ \hline 2721 \end{array}$

8.  $\begin{array}{r} 9157 \\ - 3283 \\ \hline 5874 \end{array}$

13.  $\begin{array}{r} 2926 \\ - 1958 \\ \hline 968 \end{array}$

18.  $\begin{array}{r} 4103 \\ - 3469 \\ \hline 634 \end{array}$

23.  $\begin{array}{r} 7600 \\ - 848 \\ \hline 6752 \end{array}$
4.  $\begin{array}{r} 5478 \\ - 1947 \\ \hline 3531 \end{array}$

9.  $\begin{array}{r} 8912 \\ - 4921 \\ \hline 3991 \end{array}$

14.  $\begin{array}{r} 8223 \\ - 4344 \\ \hline 3879 \end{array}$

19.  $\begin{array}{r} 6321 \\ - 544 \\ \hline 5777 \end{array}$

24.  $\begin{array}{r} 6338 \\ - 789 \\ \hline 5549 \end{array}$
5.  $\begin{array}{r} 7362 \\ - 2651 \\ \hline 4711 \end{array}$

10.  $\begin{array}{r} 6145 \\ - 5782 \\ \hline 363 \end{array}$

15.  $\begin{array}{r} 6134 \\ - 2587 \\ \hline 3547 \end{array}$

20.  $\begin{array}{r} 6805 \\ - 4866 \\ \hline 1939 \end{array}$

25.  $\begin{array}{r} 4000 \\ - 2553 \\ \hline 1447 \end{array}$

Using the Exercises

- Questions 1 to 5 involve regrouping thousands only.
- Questions 6 to 10 involve regrouping thousands and hundreds.
- Questions 11 to 15 involve regrouping thousands, hundreds, and tens.
- The remaining questions involve zeros. Provide more regrouping questions if difficulties occur here.
- Provide ample individual help.



## PRACTICE

Write the difference.

- |  |   |   |   |  |
|--|---|---|---|--|
| 1. $\begin{array}{r} 3582 \\ - 2823 \\ \hline 759 \end{array}$   | 2. $\begin{array}{r} 8167 \\ - 5493 \\ \hline 2674 \end{array}$ | 3. $\begin{array}{r} 4278 \\ - 1985 \\ \hline 2293 \end{array}$ | 4. $\begin{array}{r} 8431 \\ - 651 \\ \hline 7780 \end{array}$  | 5. $\begin{array}{r} 9181 \\ - 2468 \\ \hline 6713 \end{array}$  |
| 6. $\begin{array}{r} 6970 \\ - 2871 \\ \hline 4099 \end{array}$  | 7. $\begin{array}{r} 9460 \\ - 8881 \\ \hline 579 \end{array}$  | 8. $\begin{array}{r} 7815 \\ - 2147 \\ \hline 5668 \end{array}$ | 9. $\begin{array}{r} 4352 \\ - 1456 \\ \hline 2896 \end{array}$ | 10. $\begin{array}{r} 2333 \\ - 446 \\ \hline 1887 \end{array}$  |
| 11. $\begin{array}{r} 8721 \\ - 1932 \\ \hline 6789 \end{array}$ | 12. $\begin{array}{r} 5085 \\ - 4297 \\ \hline 788 \end{array}$ | 13. $\begin{array}{r} 1224 \\ - 358 \\ \hline 866 \end{array}$  | 14. $\begin{array}{r} 5003 \\ - 827 \\ \hline 4176 \end{array}$ | 15. $\begin{array}{r} 4030 \\ - 2642 \\ \hline 1388 \end{array}$ |

Solve.

16. A cross-country race had 1244 competitors. 758 of the runners were men. How many women runners entered the race? **486**
17. One of the races of the Olympic Games is the 1500 m run. When a runner has completed 925 m of the race, how much farther must he or she still run? **575 m**

## Limited Subtraction

This subtraction question has the same three digits (4, 5, and 9) in each numeral. The digits are in different orders.

$$\begin{array}{r} 954 \\ - 459 \\ \hline 495 \end{array}$$

Each exercise has the same digits in each numeral. Try them.

- |  |  |  |
|--|--|--|
| a. $\begin{array}{r} 58\ 923 \\ - 32\ 985 \\ \hline 25\ 938 \end{array}$ | b. $\begin{array}{r} 8\ 172\ 396 \\ - 6\ 932\ 718 \\ \hline 1\ 239\ 678 \end{array}$ | c. $\begin{array}{r} 987\ 654\ 321 \\ - 123\ 456\ 789 \\ \hline 864\ 197\ 532 \end{array}$ |
|--|--|--|

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## Assigning the Practice

Minimum: 1-17

Average: 1-17

Enriched: 6-17

## Reinforcement

1. Ask the students to find the missing digits.

- |   |   |
|---|---|
| a. $\begin{array}{r} 5\ 4\ 2\ \blacksquare \\ - \blacksquare\ 5\ \blacksquare\ 8 \\ \hline 2\ \blacksquare\ 0\ 9 \end{array}$ | b. $\begin{array}{r} \blacksquare\ \blacksquare\ 9\ \blacksquare \\ - 3\ 7\ 2\ 0 \\ \hline 4\ 7\ \blacksquare\ 9 \end{array}$ |
| c. $\begin{array}{r} 3\ \blacksquare\ \blacksquare\ \blacksquare \\ - 4\ 6\ 7 \\ \hline \blacksquare\ 5\ 3\ 3 \end{array}$    |   |

2. Ask the students to use the newspaper to compare differences in the prices of cars, furniture, or other expensive items. Have them write out the subtractions to show the actual differences.

3. Have the students complete the following.

5 thousands, 2 hundreds, 4 tens, 2 ones =

- a. 5 thousands, 2 hundreds, 3 tens, \_\_\_\_ ones
- b. 4 thousands, \_\_\_\_ hundreds, \_\_\_\_ tens, \_\_\_\_ ones
- 9 thousands, 4 ones =
- a. 8 thousands, 10 hundreds, \_\_\_\_ tens, 4 ones
- b. 8 thousands, \_\_\_\_ hundreds, \_\_\_\_ tens, 14 ones

## Enrichment

1. *Limited Subtraction*, at the bottom of page 61, should be attempted by the more capable students. Regrouping skills not yet taught are required in these exercises.

2. Have the students make up story problems based on the sales ads in the newspaper. Mount the problems to use later in an addition and subtraction review centre.

## Extra Practice

Regroup.

- 8 thousands = 7 thousands + 10 hundreds
- 4 thousands = 3 thousands + 9 hundreds + 10 tens
- 5 thousands + 6 hundreds = 4 thousands + 15 hundreds + 10 tens

Subtract.

- |   |  |  |  |
|---|--|--|--|
| 4. $\begin{array}{r} 2060 \\ - 1247 \\ \hline 813 \end{array}$  | 5. $\begin{array}{r} 1090 \\ - 389 \\ \hline 701 \end{array}$    | 6. $\begin{array}{r} 5020 \\ - 2763 \\ \hline 2257 \end{array}$  | 7. $\begin{array}{r} 4050 \\ - 685 \\ \hline 3365 \end{array}$   |
| 8. $\begin{array}{r} 6004 \\ - 4117 \\ \hline 1887 \end{array}$ | 9. $\begin{array}{r} 3100 \\ - 567 \\ \hline 2533 \end{array}$   | 10. $\begin{array}{r} 5000 \\ - 652 \\ \hline 4348 \end{array}$  | 11. $\begin{array}{r} 8000 \\ - 2552 \\ \hline 5448 \end{array}$ |
| 12. $\begin{array}{r} 1000 \\ - 756 \\ \hline 244 \end{array}$  | 13. $\begin{array}{r} 3000 \\ - 1991 \\ \hline 1009 \end{array}$ | 14. $\begin{array}{r} 4000 \\ - 2489 \\ \hline 1511 \end{array}$ | 15. $\begin{array}{r} 2000 \\ - 138 \\ \hline 1862 \end{array}$  |

## Worksheet A16

Pages 60-61

# UNIT 3 LESSON 9

## Objective A17

Round to estimate sums and differences with numbers of up to four digits.

## Introducing the Lesson

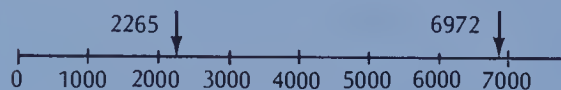
Discuss everyday situations in which estimation is used. A car driver estimates the number of kilometres left to drive and the number of litres of gas in the tank in order to know if a stop at a gas station is needed. A shopper estimates the total cost of wanted items to compare with the amount of money on hand.

## Teaching the Lesson

Explain the value of estimation. It can be used to provide a quick check on the reasonableness of an answer. Point out that **estimations** are made by **rounding** numbers. Show how the sum of 34 and 35 are estimated by rounding each addend to the nearest ten (at the top of page 62). Review the previously learned rounding rules with the cars on the number line. Talk about why the addend 34 rounds to 30 and why the addend 35 rounds to 40. Find the **exact sum** and point out how close it is to the **estimated sum** of 70.

Review rounding to the nearest ten, hundred, and thousand as studied in lesson 6 of Unit 1. Apply these skills to *estimating sums and differences*. For example:

- a. Estimate the sum of  $2265 + 6972$ .



2265 is closer to 2000.  
6972 is closer to 7000.  
 $2000 + 7000 = 9000$

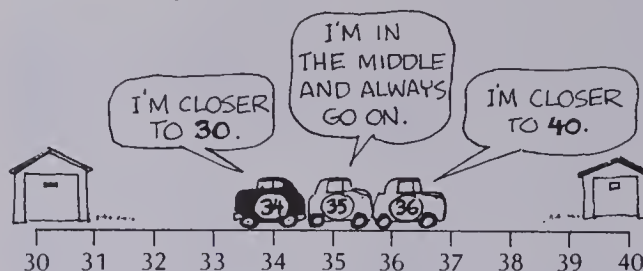
- b. Estimate the difference between 155 and 512.



155 is closer to 200.  
512 is closer to 500.  
 $500 - 200 = 300$

A second method for rounding, as explained in Lesson 6 of Unit 1, might also be reviewed at this time.

## Rounding for Estimation



$$34 + 35 = \blacksquare$$

Estimate the sum of 34 and 35.

To do this, round 34 and 35 to the nearest ten.

34 rounds to 30. 35 rounds to 40.

The sum of the rounded numbers is 70.

The estimated sum of 34 and 35 is 70.

## EXERCISES

Round each number to the nearest ten.

1. 44 **40** 2. 67 **70** 3. 29 **30** 4. 81 **80** 5. 75 **80**

Round each number to the nearest hundred

6. 649 **600** 7. 661 **700** 8. 650 **700** 9. 635 **600** 10. 684 **700**  
11. 786 **800** 12. 132 **100** 13. 383 **400** 14. 451 **500** 15. 857 **900**

Round each number to the nearest thousand.

16. 3254 **3000** 17. 2499 **2000** 18. 6627 **7000** 19. 7501 **8000** 20. 9012 **9000**

Round each number to the nearest ten.

Find the estimated sum or difference of the numbers.

21.  $\begin{array}{r} 44 \\ + 38 \\ \hline 80 \end{array}$  22.  $\begin{array}{r} 63 \\ + 32 \\ \hline 90 \end{array}$  23.  $\begin{array}{r} 15 \\ + 26 \\ \hline 50 \end{array}$  24.  $\begin{array}{r} 91 \\ - 47 \\ \hline 40 \end{array}$  25.  $\begin{array}{r} 52 \\ - 14 \\ \hline 40 \end{array}$

Round each number to the nearest hundred.

Find the estimated sum or difference of the numbers.

26.  $\begin{array}{r} 296 \\ + 272 \\ \hline 600 \end{array}$  27.  $\begin{array}{r} 443 \\ + 328 \\ \hline 700 \end{array}$  28.  $\begin{array}{r} 108 \\ + 667 \\ \hline 800 \end{array}$  29.  $\begin{array}{r} 769 \\ - 555 \\ \hline 200 \end{array}$  30.  $\begin{array}{r} 948 \\ - 261 \\ \hline 600 \end{array}$

62

## Using the Exercises

- Questions 1 to 20 involve rounding to the nearest ten, hundred, or thousand.
- Questions 21 to 30 involve rounding and estimating sums or differences. See that the children watch the signs.
- Point out that we round both addends and *then* add. If any of the students are having difficulty with rounding, provide them with more practice. An estimate of the sum or difference will not be close if the rounding has been done incorrectly.

## PRACTICE

Find the estimated sum or difference of the numbers.

Round each number to the nearest ten.

$$\begin{array}{r} 1. \quad 23 \\ + 50 \\ \hline 70 \end{array} \quad \begin{array}{r} 2. \quad 19 \\ + 31 \\ \hline 50 \end{array} \quad \begin{array}{r} 3. \quad 35 \\ + 45 \\ \hline 90 \end{array} \quad \begin{array}{r} 4. \quad 73 \\ - 6 \\ \hline 60 \end{array} \quad \begin{array}{r} 5. \quad 69 \\ - 16 \\ \hline 50 \end{array}$$

Round each number to the nearest hundred.

$$\begin{array}{r} 6. \quad 467 \\ + 324 \\ \hline 800 \end{array} \quad \begin{array}{r} 7. \quad 684 \\ + 108 \\ \hline 800 \end{array} \quad \begin{array}{r} 8. \quad 524 \\ + 329 \\ \hline 800 \end{array} \quad \begin{array}{r} 9. \quad 832 \\ - 448 \\ \hline 400 \end{array} \quad \begin{array}{r} 10. \quad 754 \\ - 260 \\ \hline 500 \end{array}$$

Round each number to the nearest thousand.

$$\begin{array}{r} 11. \quad 2521 \\ + 1843 \\ \hline 5000 \end{array} \quad \begin{array}{r} 12. \quad 3294 \\ + 6182 \\ \hline 9000 \end{array} \quad \begin{array}{r} 13. \quad 4529 \\ - 3259 \\ \hline 2000 \end{array} \quad \begin{array}{r} 14. \quad 8704 \\ - 3516 \\ \hline 5000 \end{array} \quad \begin{array}{r} 15. \quad 4016 \\ - 1773 \\ \hline 2000 \end{array}$$

Solve.

16. Jewel bowled two games. The scores in the two games were 189 and 216. Estimate her total score. **400**

## Treasure Hunt

Follow the paths from the tree to the treasures. Round each number on the path to the nearest hundred. Add the rounded numbers to find the amount in the treasure chest. Which treasure is the most valuable? **B**



63

## Assigning the Practice

Minimum: 1-16

Average: 1-16

Enriched: 1-16

## Reinforcement

1. Assign *Treasure Hunt* at the bottom of page 63. Have the students show you their estimated sums for all three paths.

2. Two, three, or four people can play this game. Each person needs a card and some markers. The players take turns. The rules are:

- Choose two balls from the rack.
- Add the numbers on the balls.
- If the sum is on your card, place a marker on it. Players estimate, but may not use paper and pencil, before they choose balls.
- The first player to cover a card wins.

Rack

24	33	63	59
58	27	61	36

Cards

97	51	85
82	117	94
87	124	63

63	91	121
122	86	60
57	95	99

85	90	88
94	69	92
63	91	121

87	124	63
119	96	122
120	83	57

## Extra Practice

Round to the nearest ten.

$$1. \quad 16 \rightarrow 20 \quad 2. \quad 49 \rightarrow 50 \quad 3. \quad 82 \rightarrow 80 \quad 4. \quad 55 \rightarrow 60$$

Round to the nearest hundred.

$$5. \quad 848 \rightarrow 800 \quad 6. \quad 750 \rightarrow 800 \quad 7. \quad 127 \rightarrow 100 \quad 8. \quad 665 \rightarrow 700$$

Round to the nearest thousand.

$$9. \quad 2455 \rightarrow 2000 \quad 10. \quad 5340 \rightarrow 5000 \quad 11. \quad 3090 \rightarrow 3000$$

Solve.

12. In a rodeo saddle bronc competition, Jonah scored first 74 and then 67 points on his two rides. Estimate his total score. **140**
13. Sophie's times in the barrel racing contest were 13 seconds and 18 seconds. Estimate her total time for the two rides. **30 s**

## Worksheet A17

Pages 62-63

## Enrichment

Ask the students to estimate the cost of a complete set of new clothing and equipment for their favourite sport. After making an itemized list of their choices, have them find the exact costs by using a catalog.



## UNIT 3 LESSON 10

### Objective PS3

Use a problem solving strategy.

### Introducing the Lesson

Review everyday situations in which simple addition and subtraction are needed—the total price of a list of purchases, the exact payment of a bill, the change one should receive, total scores, the difference between scores, amounts needed when changing recipes, and so on. Try to include examples that involve the theme of sports.

### Teaching the Lesson

Tape food ads from the local paper to the chalkboard. Ask the students to make up a shopping list of up to five items using the ads. Have them find the prices and write them down beside each item. Ask the students to find out how much money will be needed to do the shopping. Have them record their answers in a statement.

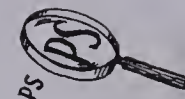
Review with the students the steps they took to find the total cost.

- List the facts.
- Decide what to do.
- Do the arithmetic.
- Answer the question.

Point out the problem at the top of page 64. Show how the same four steps, the problem solving strategy used to find the cost of the food, were used again. Stress the value of these four steps for solving problems.

## Solving Problems

Peter scored 25 goals in the first half of the hockey season. He scored 17 goals in the second half. How many goals did he score altogether?



- 1 Read the problem.  
List the **facts**.

25 goals  
17 goals

- 2 Look for key words.  
**Decide** what to do.

"altogether"  
tells you to  
**add**

- 3 Do the **arithmetic**.

25  
+ 17  
—  
42

- 4 **Answer** the question.

Peter scored  
42 goals.

### EXERCISES

Solve.

- Joan scored **36 field goals** in the first part of the season and **14** in the second. What was her **total**? **50**  
Facts: 36 field goals, 14 field goals.  
Decide: "total" tells you to **add**.  
Arithmetic:  **$36 + 14 = 50$**   
Answer:
- Joe hit **62 home runs** this season and **42** last season.  
**How many more** did he hit this season? **20**
- In a dart game, Ron scored **150 points** and Anna scored **225**.  
**By how much** did Anna win? **75**

### Using the Exercises

- Key words in these exercises are in bold type. Discuss each of them in relation to the four steps outlined in the lesson.

## PRACTICE

Solve these problems.

- Henry scored 47 goals in the first half of the hockey season. His teammate Jon scored 35. How many more goals did Henry score? **12**
- Wendy and Wally bowl together on a team. In one of their best games Wendy scored 246 points and Wally scored 235. What was their total score in that game? **481**
- In the 1976 Summer Olympic Games, the Soviet Union won 125 medals, East Germany won 90 medals, and Poland won 25. How many medals did these three countries win altogether? **240**
- In a golf tournament Mildred scored 325 and Steven 298. By how much did Steven win? **27 (Low score wins in golf.)**

## REVIEW

Subtract.

A13	1. $\begin{array}{r} 33 \\ -18 \\ \hline 15 \end{array}$	2. $\begin{array}{r} 88 \\ -49 \\ \hline 39 \end{array}$	3. $\begin{array}{r} 72 \\ -63 \\ \hline 9 \end{array}$	4. $\begin{array}{r} 67 \\ -29 \\ \hline 38 \end{array}$	5. $\begin{array}{r} 80 \\ -72 \\ \hline 8 \end{array}$
A14	6. $\begin{array}{r} 737 \\ -419 \\ \hline 318 \end{array}$	7. $\begin{array}{r} 572 \\ -364 \\ \hline 208 \end{array}$	8. $\begin{array}{r} 855 \\ -426 \\ \hline 429 \end{array}$	9. $\begin{array}{r} 221 \\ -107 \\ \hline 114 \end{array}$	10. $\begin{array}{r} 910 \\ -409 \\ \hline 501 \end{array}$
A15	11. $\begin{array}{r} 854 \\ -579 \\ \hline 275 \end{array}$	12. $\begin{array}{r} 385 \\ -289 \\ \hline 96 \end{array}$	13. $\begin{array}{r} 662 \\ -489 \\ \hline 173 \end{array}$	14. $\begin{array}{r} 521 \\ -348 \\ \hline 173 \end{array}$	15. $\begin{array}{r} 900 \\ -783 \\ \hline 117 \end{array}$
A16	16. $\begin{array}{r} 8642 \\ -3865 \\ \hline 4777 \end{array}$	17. $\begin{array}{r} 7120 \\ -4459 \\ \hline 2661 \end{array}$	18. $\begin{array}{r} 3116 \\ -1789 \\ \hline 1327 \end{array}$	19. $\begin{array}{r} 5315 \\ -2428 \\ \hline 2887 \end{array}$	20. $\begin{array}{r} 6800 \\ -2932 \\ \hline 3868 \end{array}$

65

## Assigning the Practice

Minimum: 1-4

Average: 1-4

Enriched: 1-4

Questions	Objective	Pages
1-5	A13	56-57
6-10	A14	58-59
11-15	A15	60-61
16-20	A16	62-63

## Reinforcement

1. Ask the students to read the problems in the Practice sections of the lessons in Unit 1 and Unit 2 and to list the key words that help them to decide whether to add or subtract.

2. For two of the problems on page 65, ask the students to tell what strategy they would use for problem solving. Have them use the flow chart on page 64 as a guide.

## Enrichment

1. Have the students make up sports problems using the newspaper or sports magazines for facts. Mount their problems on workcards. Cards can be exchanged with a partner for solving or used later at a review centre.

2. Direct the students to solve the following problem. Ask them to explain how the four problem solving steps were used.

How many little squares will fit in the big square?



## Extra Practice

## Worksheet PS3

Pages 64-65

Solve.

- In a dart game Linda scored 178 points and Terry scored 200. How many points did Terry get? **200**
- Howard made 74 home runs this season and 57 last season. How many home runs did he make in both seasons? **131**
- The attendance at Friday night's hockey game was 2678. The attendance at the Saturday night game was 3876. How many people attended on the two nights? **6554**
- Last night the temperature was 25°C and this morning it is 11°C. How much did the temperature drop during the night? **14°C**

## Problem Solving Activities

Assign Level 4, Unit 2

Unit 3 Objective	Test Questions	Pages
A9	1-4, 9, 10	46-47
A10	5-8, 11, 12	48-49
A11	13-16	50-51
A12	17-20	52-53
A13	21-23	54-55
A14	24, 25	56-57
A15	26, 27	58-59
A16	28-30	60-61
A17	31-35	62-63
PS	36	

# TEST

# UNIT 3

Add.

1.  $\begin{array}{r} 89 \\ + 6 \\ \hline 95 \end{array}$
2.  $\begin{array}{r} 58 \\ + 13 \\ \hline 71 \end{array}$
3.  $\begin{array}{r} 45 \\ + 26 \\ \hline 71 \end{array}$
4.  $\begin{array}{r} 34 \\ + 758 \\ \hline 792 \end{array}$
5.  $\begin{array}{r} 43 \\ + 82 \\ \hline 125 \end{array}$
6.  $\begin{array}{r} 56 \\ + 92 \\ \hline 148 \end{array}$
7.  $\begin{array}{r} 763 \\ + 95 \\ \hline 858 \end{array}$
8.  $\begin{array}{r} 295 \\ + 410 \\ \hline 705 \end{array}$
9.  $\begin{array}{r} 14 \\ + 51 \\ + 28 \\ \hline 93 \end{array}$
10.  $\begin{array}{r} 208 \\ + 419 \\ + 357 \\ \hline 984 \end{array}$
11.  $\begin{array}{r} 55 \\ 60 \\ + 42 \\ \hline 157 \end{array}$
12.  $\begin{array}{r} 431 \\ 74 \\ + 290 \\ \hline 795 \end{array}$
13.  $\begin{array}{r} 65 \\ + 59 \\ \hline 124 \end{array}$
14.  $\begin{array}{r} 417 \\ + 488 \\ \hline 905 \end{array}$
15.  $\begin{array}{r} 96 \\ 82 \\ + 35 \\ \hline 213 \end{array}$
16.  $\begin{array}{r} 245 \\ 306 \\ + 172 \\ \hline 723 \end{array}$
17.  $\begin{array}{r} 2806 \\ + 199 \\ \hline 3005 \end{array}$
18.  $\begin{array}{r} 3868 \\ + 5277 \\ \hline 9145 \end{array}$
19.  $\begin{array}{r} 5944 \\ + 1376 \\ \hline 7320 \end{array}$
20.  $\begin{array}{r} 4173 \\ 825 \\ + 2694 \\ \hline 7692 \end{array}$

Subtract.

21.  $\begin{array}{r} 38 \\ - 9 \\ \hline 29 \end{array}$
22.  $\begin{array}{r} 70 \\ - 46 \\ \hline 24 \end{array}$
23.  $\begin{array}{r} 82 \\ - 53 \\ \hline 29 \end{array}$
24.  $\begin{array}{r} 496 \\ - 79 \\ \hline 417 \end{array}$
25.  $\begin{array}{r} 755 \\ - 326 \\ \hline 429 \end{array}$
26.  $\begin{array}{r} 320 \\ - 185 \\ \hline 135 \end{array}$
27.  $\begin{array}{r} 600 \\ - 284 \\ \hline 316 \end{array}$
28.  $\begin{array}{r} 5315 \\ - 428 \\ \hline 4887 \end{array}$
29.  $\begin{array}{r} 8642 \\ - 3865 \\ \hline 4777 \end{array}$
30.  $\begin{array}{r} 7020 \\ - 4159 \\ \hline 2861 \end{array}$

Round to the nearest 10, 100, and 1000.

31. 6927  $\begin{array}{r} 6930 \\ 6900 \\ 7000 \end{array}$
32. 1082  $\begin{array}{r} 1080 \\ 1100 \\ 1000 \end{array}$
33. 579  $\begin{array}{r} 580 \\ 600 \\ 1000 \end{array}$
34. 306  $\begin{array}{r} 310 \\ 300 \\ 0 \end{array}$
35. 8951  $\begin{array}{r} 8950 \\ 9000 \\ 9000 \end{array}$

Solve.

36. At a fishing tournament the Canadian team caught three tuna fish with masses of 512 kg, 493 kg, and 476 kg. What was the total mass of the three fish?  $1481 \text{ kg}$

## Post-test

## Unit 3

Add.

1.  $\begin{array}{r} 78 \\ + 12 \\ \hline 90 \end{array}$
2.  $\begin{array}{r} 47 \\ + 49 \\ \hline 96 \end{array}$
3.  $\begin{array}{r} 256 \\ + 35 \\ \hline 291 \end{array}$
4.  $\begin{array}{r} 827 \\ + 109 \\ \hline 936 \end{array}$
5.  $\begin{array}{r} 48 \\ + 61 \\ \hline 109 \end{array}$
6.  $\begin{array}{r} 87 \\ + 61 \\ \hline 148 \end{array}$
7.  $\begin{array}{r} 349 \\ + 290 \\ \hline 639 \end{array}$
8.  $\begin{array}{r} 864 \\ + 85 \\ \hline 949 \end{array}$
9.  $\begin{array}{r} 15 \\ 27 \\ + 18 \\ \hline 60 \end{array}$
10.  $\begin{array}{r} 259 \\ 12 \\ + 125 \\ \hline 396 \end{array}$
11.  $\begin{array}{r} 65 \\ 31 \\ + 82 \\ \hline 178 \end{array}$
12.  $\begin{array}{r} 450 \\ 277 \\ + 142 \\ \hline 869 \end{array}$
13.  $\begin{array}{r} 78 \\ + 165 \\ \hline 243 \end{array}$
14.  $\begin{array}{r} 359 \\ + 261 \\ \hline 620 \end{array}$
15.  $\begin{array}{r} 88 \\ 43 \\ + 79 \\ \hline 210 \end{array}$
16.  $\begin{array}{r} 256 \\ 147 \\ + 398 \\ \hline 801 \end{array}$
17.  $\begin{array}{r} 2852 \\ + 3914 \\ \hline 6766 \end{array}$
18.  $\begin{array}{r} 6241 \\ + 3419 \\ \hline 9660 \end{array}$
19.  $\begin{array}{r} 826 \\ + 915 \\ \hline 1741 \end{array}$
20.  $\begin{array}{r} 6775 \\ + 1988 \\ \hline 8763 \end{array}$



# PROBLEM SOLVING

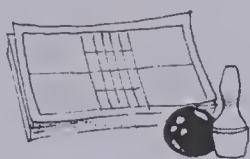
Use the facts in the pictures to solve the problems.

1.



By how much did they win? **19**

2.



How many points did Ann and Bill make? **449**

3.



How many points do they need to catch up? **4**

4. During the regular hockey season, Philip scored 56 goals and had 49 assists. What was Philip's point total for the season? **105**
5. Marcia scored 5136 points for tricks to win a water ski competition. Elizabeth, the second-place finisher, scored 4958 points in the same event. Marcia scored how many more points than Elizabeth? **178**
6. The total possible score for three games in ten pin bowling is 900. In the women's series, the record score is 818. How many pins were missed in this record series? **82**
7. The quarterback for the Roughriders ran 580 running and passing plays during one season. 296 of the plays were passes. How many of the plays were running plays? **284**

Write a problem using the information given.

8. 84 times at bat  
39 hits  
sport: softball

9. winning score 276  
par for course 288  
sport: golf

Subtract.

- |   |   |  |  |   |
|---|---|--|--|---|
| 21. $\begin{array}{r} 47 \\ - 19 \\ \hline 28 \end{array}$    | 22. $\begin{array}{r} 61 \\ - 24 \\ \hline 37 \end{array}$    | 23. $\begin{array}{r} 90 \\ - 38 \\ \hline 52 \end{array}$       | 24. $\begin{array}{r} 375 \\ - 128 \\ \hline 247 \end{array}$    | 25. $\begin{array}{r} 962 \\ - 437 \\ \hline 525 \end{array}$   |
| 26. $\begin{array}{r} 432 \\ - 264 \\ \hline 168 \end{array}$ | 27. $\begin{array}{r} 907 \\ - 448 \\ \hline 459 \end{array}$ | 28. $\begin{array}{r} 5826 \\ - 1932 \\ \hline 3894 \end{array}$ | 29. $\begin{array}{r} 8720 \\ - 6943 \\ \hline 1777 \end{array}$ | 30. $\begin{array}{r} 2005 \\ - 487 \\ \hline 1518 \end{array}$ |

Estimate the sum or difference.

Round each number to its first digit.

- |   |   |   |  |   |
|---|---|---|--|---|
| 31. $\begin{array}{r} 426 \\ + 371 \\ \hline 800 \end{array}$ | 32. $\begin{array}{r} 2798 \\ + 987 \\ \hline 4000 \end{array}$ | 33. $\begin{array}{r} 486 \\ - 349 \\ \hline 200 \end{array}$ | 34. $\begin{array}{r} 6538 \\ - 2649 \\ \hline 4000 \end{array}$ | 35. $\begin{array}{r} 9861 \\ - 985 \\ \hline 9000 \end{array}$ |
|---|---|---|--|---|

# UNIT 4

## Measurement

Theme: In the Country

Lesson		Objective	Pages
Preview		Review metres, centimetres, and money.	69
1	M3	Recognize and use the millimetre as a unit of length.	70-71
2	M4	Recognize and use the kilometre as a unit of length.	72-73
3	M5	Use appropriate units for length estimation and measurement.	74-75
4	M6	Understand and apply the concept of perimeter.	76-77
5	M7	Recognize and use the gram and kilogram as units of mass.	78-79
6	M8	Convert cents to dollars and dollars to cents.	80-81
7	M9	Add and subtract money up to \$99.99.	82-83
8	PS4	Solve simple measurement problems involving length, mass, and money.	84-85
9	M10	Use the additive method to make change up to \$10.00.	86-87
10	M11	Recognize and use the millilitre as a unit of capacity.	88-89
Test		Measurement	90
Review		Addition and Subtraction	91

## Materials

metre sticks  
 centimetre rulers with millimetre markings  
 several different polygons made of stiff paper  
 household items sold by mass  
 household items sold by capacity  
 centicubes  
 floor scale, balance scale, and masses  
 play money: bills and coins  
 Canadian money rubber stamps  
 handmade price tags  
 store discount coupons  
 drive-in restaurant order forms  
 newspaper ads  
 catalogs  
 graduated cylinders for measuring capacity  
 various-sized containers for measuring capacity

# About This Unit

The purpose of this unit is to develop measurement and money concepts, skills, and routines. The lessons concern length, mass, capacity, dollars, and cents.

The instructional strategy for the length, mass, and capacity lessons is to develop a related cluster of skills that review and consolidate the basic features of the measurement process: attribute to be measured, non-standard and standard measurement units, estimation, comparison, and use of the measuring instruments. Each lesson is built on an everyday problem that involves measurement. It is important that the students understand the attribute that is being measured and eventually become adept in using measurements in real-life situations. The frequent estimation of measurements should be encouraged. When possible, comparisons of estimates and actual measures also should be made.

The instructional strategy for the money lessons is to develop skills that will be useful in everyday situations: reading and writing amounts of money in cents and dollars, understanding the place value of a numeral written in dollars and cents, adding and subtracting to solve problems involving money, and making change.

Learning to measure and to use money is a “hands on” process. Consequently, many manipulative materials and measuring instruments should be available for the students to investigate the problem situations.

## Ideas

The theme of this unit is *In the Country*. If possible, arrange a class visit to the country, to a farm, or to a park. If such a visit is planned in conjunction with a science project or other activity, it might be advisable to teach this unit at that time.

Students should go on the field trip equipped with notebooks, metric measuring tapes, and any other measuring devices available. There are limitless possibilities for such a trip.

Some suggestions are:

1. comparing sizes of animals.
2. heights of plants.
3. diameters of flowers.
4. circumferences of trees.
5. sizes of fruit.

Also, use of measurement on road signs and other signs should be noted on the trip. On the bus trip, play an estimation game. A student yells out or raises a hand when he or she thinks the bus has gone one kilometre from a given starting point. The last student to signal, before the odometer actually measures a kilometre is the winner.

## Bulletin Board Display

With large letters, put up the word MEASUREMENT across the top of the bulletin board. Then divide the bulletin board into three sections, each with its own subtitle: length, mass, capacity or volume.

As the lessons proceed, add appropriate pictures and objects to each section. Be sure to include the measuring devices or pictures of them in each section. Each student should be encouraged to make at least one contribution to the collection on the bulletin board, making sure that he/she has a good reason for putting an item in a particular section.

Students will soon realize that some items could be in all three sections:

A litre of milk—Measure its length.

Measure its mass.

Measure its capacity.



# UNIT 4

## MEASUREMENT I



Unit 4 Objectives	Test Questions	Pages
M3, M5	1-3, 5	70-71, 74-75
M4	4	72-73
M6	7-8	76-77
M7	9-11	78-79
M8	12-17	80-81
M9	18-21	82-83
M10	22-23	86-87
M11	6, 24-26	88-89

### Pretest

### Unit 4

1. Measure the line segment in millimetres.

\_\_\_\_\_ 99 mm

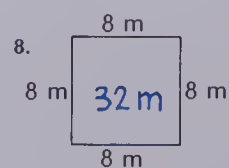
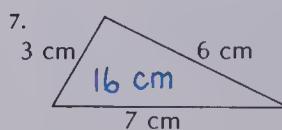
What unit of length would you use to measure:

2. the length of a ski cm 3. the distance from Ottawa to Montreal? km

What is the missing number?

4. 90 mm = 9 cm 5. 2 L = 2000 mL 6. 7000 m = 7 km

What is the perimeter of each figure?



Estimate the mass of each.







9. a steak 2 kg or 220 g 10. a watermelon 4 kg or 440 g 11. a grape 4 g or 4 kg

# How Big?

Choose the best answer

1. A blueberry is ■ cm wide.  
 1    10    100  
 (1)
2. A tomato is ■ cm wide.  
 1    8    80  
 (8)
3. A car is ■ m long.  
 1    5    30  
 (5)
4. A jug of cider is ■ cm tall.  
 2    20    200  
 (20)
5. The pony's enclosure is ■ m long.  
 2    20    200  
 (20)
6. A chicken is ■ cm tall.  
 5    10    35  
 (35)
7. A two-story building is ■ m high.  
 8    40    80  
 (8)
8. The length of the race held on field day was ■ m.  
 1    5    100  
 (100)

Choose the best answer.

9.  2 cm (2 m) 20 m	10.  50¢ \$5 \$50	11.  4 cm (14 cm) 4 m
12.  2 cm 2 m (20 cm)	13.  10 m 50 m 500 m	14.  5¢ (60¢) \$ 6

69

## UNIT 4 PREVIEW

### Suggestions

This lesson reviews **metre**, **centimetre**, and **money** concepts previously learned. The understanding of these concepts is essential to this unit.

Have the students recall and compare the two measures of length: **metre** and **centimetre**.

1. Show the class a metre stick and have the students stretch out their arms about 1 m. Test their approximations with the metre stick.

2. Show one centimetre on the metre stick. Have the students make a 1 cm distance between their thumbs and forefingers.

Be sure each person in the class can visualize the difference between a metre and a centimetre and knows the abbreviations, **m** and **cm**. Have the students approximate the lengths of various things seen in the picture on page 68.

Write the symbols for **dollars** and **cents** (\$ and ¢) on the chalkboard. Ask the students to approximate the costs of items seen on page 68. Have someone write the costs properly on the chalkboard. Discuss other items that could be for sale at a country market. Write their costs on the board.

bushel of apples — \$7.95  
 one apple — 15¢

### About the Page

All students should be able to choose the appropriate responses required on page 69. The questions on the metre and the centimetre prepare the students for Lessons 1, 2, 3, 4, and 8 of this unit. Questions 10 and 14 prepare them for Lessons 6, 7, 8, and 9 of this unit.

### Reinforcement

Dictate various amounts of money in cents and in dollars and lengths in centimetres and metres. Have the students write them down properly in their abbreviated form.

six dollars ... \$6    eleven metres ... 11 m

Write each amount as a numeral with a dollar sign.

12. 6¢ = \$0.06    13. 39¢ = \$0.39    14. 112¢ = \$1.12

Write each amount as a numeral with a cent sign.

15. \$0.05 = 5¢    16. \$0.75 = 75¢    17. \$1.25 = 125¢

Add or subtract.

- |  |   |   |  |
|--|---|---|--|
| 18. $\begin{array}{r} \$3.25 \\ - 1.98 \\ \hline \$1.27 \end{array}$ | 19. $\begin{array}{r} \$9.52 \\ + 6.85 \\ \hline \$16.37 \end{array}$ | 20. $\begin{array}{r} \$43.15 \\ - 29.95 \\ \hline \$13.20 \end{array}$ | 21. $\begin{array}{r} \$68.24 \\ + 95.56 \\ \hline \$163.80 \end{array}$ |
|--|---|---|--|

What is the change?

22. for 37¢ from \$1.00    63¢    23. for \$4.95 from \$10.00    \$5.05

Estimate the capacity of each.

24. a fish bowl: 200 mL or 2 L    25. a nail polish bottle: 14 mL or 400 mL  
 26. a tube of toothpaste: 1 L or 150 mL



# UNIT 4 LESSON 1

## Objective M3

Recognize and use the millimetre as a unit of length.

## Introducing the Lesson

Begin a discussion on measuring lengths by choosing a *non-standard* unit of length (eraser) and measuring several smaller classroom objects. Gradually find smaller and smaller objects to measure for which the eraser is too large. Devise an even smaller unit of measure (e.g., the width of a paper clip wire) for determining these very small lengths. After measuring a few objects with the paper clip wire, decide how many wire widths equal one eraser length. Have the students determine lengths of various small objects in eraser lengths and in paper clip wire widths.

## Teaching the Lesson

Explain that the metric system of measurement has a *standard unit* for measuring very small lengths: the **millimetre**. Point out that it is shorter than the eraser length but about the same as a paper clip wire width. Read and discuss the statements at the top of page 70.

Distribute centimetre rulers to each student. Explain that *ten millimetres is one centimetre*. Write this relationship on the chalkboard and explain the unit abbreviations.

$$10 \text{ mm} = 1 \text{ cm}$$

Ask the students to point to such lengths as 20 mm and 30 mm.

Demonstrate how these lengths can be expressed in centimetres as well.

$$20 \text{ mm} = 2 \text{ cm}$$

$$30 \text{ mm} = 3 \text{ cm}$$

With a metre stick, show these centimetre and millimetre relationships.

$$8 \text{ cm} = 80 \text{ mm}$$

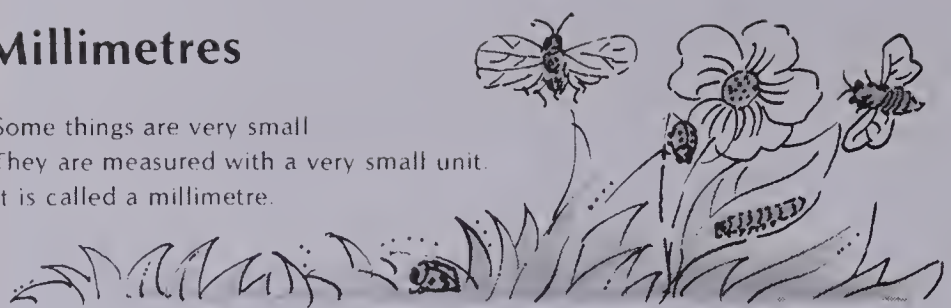
$$35 \text{ cm} = 350 \text{ mm}$$

$$750 \text{ mm} = 75 \text{ cm}$$

Group students in pairs to draw line segments with their rulers which their partners then measure in millimetres.

## Millimetres

Some things are very small.  
They are measured with a very small unit.  
It is called a millimetre.



A centimetre is divided into 10 units.  
Each unit is called a **millimetre (mm)**.  
A millimetre is about as wide as the wire of a paper clip.



That's very small

## EXERCISES

Use a ruler to measure each insect.

1. sandfly 4 mm
2. mosquito 8 mm
3. bumble bee 12 mm
4. ant 5 mm

Measure in millimetres

5. 21 mm
6. 14 mm
7. 25 mm
8. 16 mm
9. 13 mm
10. 9 mm
11. 2 mm
12. 5 mm

70

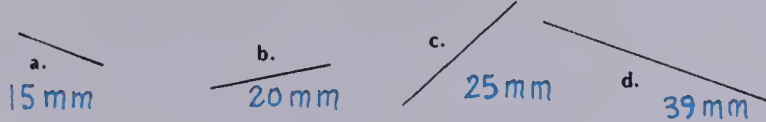
## Using the Exercises

- The developmental exercises give the students experience in measuring real objects in millimetres. Only one length is measured in each question. Make sure that the pupils understand how to use their rulers before assigning the developmental exercises. The procedure must become automatic: place the "0" mark at one end of the line segment, locate the other end of the segment, and read a number to know the length.
- A line segment is drawn below each object so that the length to be measured is clear.
- Question 1 shows how the centimetre ruler should be placed at the segment to be measured.



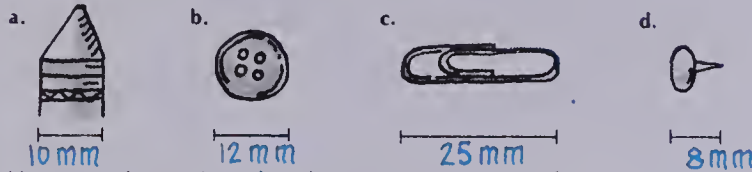
## PRACTICE

1. Write the length of each line segment in millimetres.



2. Which line segment above is the longest? **d**  
Which is the shortest? **a**

3. Measure each object in millimetres.



4. Here are the paths taken by two termites. Find the length of each path. Which path is shorter?  
What is the difference in the lengths? **7 mm**



5. Draw a line segment 6 cm long. How long is it in millimetres? **60 mm**  
6. Draw a line segment 70 mm long. How long is it in centimetres? **7 cm**

Copy and complete the equations.

7. 1 cm = **10** mm      8. 5 cm = **50** mm      9. 25 cm = **250** mm  
10. 10 mm = **1** cm      11. 40 mm = **4** cm      12. 140 mm = **14** cm

## Hammer This One!

A nail is needed to go through 15 mm of plywood,  
8 mm of plaster, and 2 cm of sheeting.  
How long must the nail be? **43 mm**

Draw a picture to help solve this problem.

71

## Assigning the Practice

Minimum: 1-3, 6

Average: 1-6

Enriched: 1-10

## Reinforcement

1. Assign *Hammer This One!* at the bottom of page 71. The problem is practical and the required drawing should ensure success with the solution.

2. Have a classroom Measurement Centre in use during this unit. Activities at the Centre may be written on cards and could include:

a. Measuring various lengths of string in millimetres. Each string should be numbered so that the students can read their findings.

b. Measuring and recording the lengths of various old pencils in millimetres.

c. Drawing line segments in specified millimetre lengths.

d. Measuring and recording the thickness in millimetres of various books.

## Enrichment

You might star the more challenging activity cards at the Measurement Centre. Activities could include:

a. Cut string into six different, specified millimetre lengths. Glue them to stiff paper in a geometric design.

b. Having numbered paper strips of various lengths, first write an estimate of the length of each in millimetres and then the actual, measured length.

c. From a box of various-sized, numbered buttons, record estimated widths in millimetres and then the actual, measured widths.

## Extra Practice

## Worksheet M3

Pages 70-71

Measure in millimetres.

1. **23 mm**      2. **9 mm**      3. **18 mm**      4. **38 mm**

5. **23 mm** **17 mm** **10 mm** **53 mm** **20 mm** **123 mm total**

6. **9 mm** **19 mm** **37 mm** **9 mm** **61 mm** **18 mm** **153 mm total**

Draw a line segment of each of these lengths.

7. 3 mm      8. 17 mm      9. 94 mm

Copy and complete the equations.

10. 240 mm = **24** cm      11. 150 mm = **15** cm      12. 72 cm = **720** mm

# UNIT 4 LESSON 2

## Objective M4

Recognize and use the kilometre as a unit of length.

## Introducing the Lesson

Open a discussion on highway travel. Allow time for the students to mention various destinations to which they have driven on highways. Talk about the kinds of signs one sees along the highway, focusing on distance signs. Ask the students to report what these signs have shown (40 km, 88 km, 25 km, etc.). Point out that distance, or a long length, is measured in **kilometres** (kilometres), or **km** in its short form.

If possible, take the pupils outside and point out a tree, building, or sign that is a kilometre away. Then have all the students walk the distance to "get the feel of" 1 km.

## Teaching the Lesson

"Look at the picture on page 72. The car is nearing its destination. Where do you think it's going?" *Bytown.* "How much farther must the car travel?"

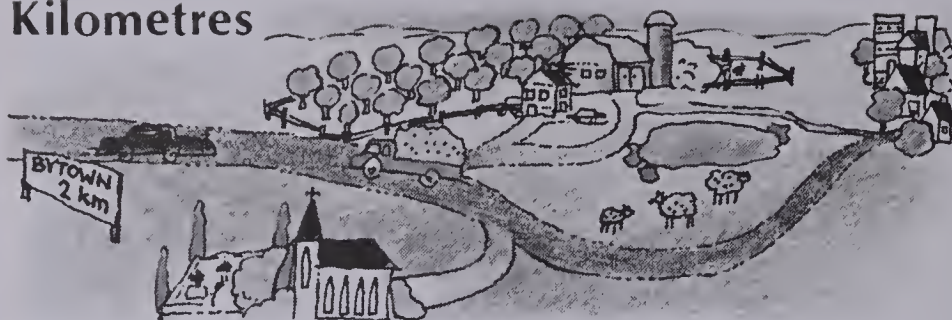
*Two kilometres.* Estimate the time it would take a car to travel 2 km (1 to 10 min, depending on the speed limit).

Note, on page 72, the time it would take to hike 1 km (ten minutes). Have the students think of places that are about ten minutes apart from each other for a person travelling on foot. Estimate the distances in kilometres that students travel to school, to a friend's house, to a movie, etc. Use the guide, "You can hike 1 km in about ten minutes."

All students should understand what an odometer looks like and how to read it. They should also know how to find the distance travelled on a trip by finding the difference between two odometer readings. The reading at the start of a journey is subtracted from the reading at the end to find the total kilometres travelled on the trip.

Point out that maps are drawn to *scale* to indicate actual distance.

## Kilometres



Some distances are very large.

They are measured with a unit much larger than a metre.

This unit is called a **kilometre (km)**.

$$1 \text{ km} = 1000 \text{ m}$$

You can hike 1 km in about ten minutes

## EXERCISES

Discuss with your classmates. Then write an answer.

- What two buildings in your area are about 1 km apart? *Answers vary.*
- What place would be about 2 km from your school? *Answers vary.*
- How far away is the next town or city? *Answers vary.*

What is your answer?

- Sam walks to school in 30 min. About how far does he live from the school? *3 km*
- How far could you hike in one hour? *6 km*

Use the odometer readings to find the distance travelled on each trip.

6.	Hamilton	7.	Regina	8.	Edmonton
	6 8 4 2		3 4 1 7		4 8 3 7
	Niagara Falls		Saskatoon		St John
	6 9 1 9		3 6 7 1		9 2 5 0
	<i>77 km</i>		<i>254 km</i>		<i>4413 km</i>

## Using the Exercises

- Questions 1 to 3 should be done orally with class discussion.
- Questions 4 and 5 have the students approximating distances according to the guide, "You can hike 1 km in about ten minutes."
- Questions 6 to 8 require that the students know how to read an odometer and how to subtract two readings to find the distance travelled.

## Assigning the Practice

Minimum: 1-5

Average: 1-12

Enriched: 1-12

## Reinforcement

1. Assign *Math dREAMs* at the bottom of page 73. You might give a pile of paper to those students who need a tangible example.

2. Prepare a chart and cards (naming familiar places) as shown below. Have the students place each card on the board according to how far the place is from their home.

Less than 1 km	1 km	More than 1 km
Grocery store	Post office	Downtown
Gas station	Park	Zoo

3. Ask the students to look at a road map distance chart and write how many kilometres it is from their home to five different cities.

4. Practice might also be given in *rounding* distances. Explain that we often use a rounded number of kilometres when we speak of large distances.

"3175 km rounded to the nearest hundred is 3200 km."

## Enrichment

1. Have the students think of three places in their area and draw a map to scale (1 cm = 1 km) to show the approximate distances between these places.

2. Encourage the students to think of exciting vacation places. Have them research the actual distance in kilometres to these places. Display the findings on a large map of the world.

**Map**

Scale: 1 cm = 1 km

Billy and Cara used this map to find the buried treasure on Lonely Island

How far is it

- from the boat to the pine tree? **7 km**
- from the pine tree to the swamp? **3 km**
- from the swamp to the mine shaft? **4 km**
- from the mine shaft to the rock? **1 km**
- from the boat to the rock? **15 km**

Round each distance to the nearest hundred kilometres

- Regina to Ottawa, 2777 km **2800 km**
- Moncton to Quebec, 795 km **800 km**
- Montreal to Calgary, 3674 km **3700 km**
- Winnipeg to Vancouver, 2398 km **2400 km**
- Victoria to St. John's, 6892 km **6900 km**
- Niagara Falls to Thunder Bay, 1541 km **1500 km**
- Halifax to Sydney, 409 km **400 km**

## Math dREAMs

If 10 sheets of paper are 1 mm thick, how many sheets would there be in a pile 5 cm high? **500**

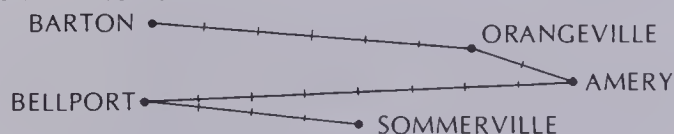


73

## Extra Practice

## Worksheet M4

Pages 72-73



How far is it

- from Bellport to Sommerville? **4 km**
- from Bellport to Amery? **8 km**
- from Barton to Orangeville? **6 km**
- from Orangeville to Amery? **2 km**

Round each distance to the nearest hundred kilometres.

- 862 km **900 km**
- 741 km **700 km**
- 6372 km **6400 km**
- 5555 km **5600 km**
- 256 km **300 km**
- 9084 km **9100 km**

Use the odometer readings to find the distance travelled on each trip.

- Kenora  
2 5 6 4  
Regina  
3 3 4 0 **776 km**
- Rivière-Du-Loup  
3 9 8 1  
Gaspé  
4 4 8 0 **499 km**
- Whitehorse  
6 2 5  
Calgary  
3 0 1 0 **2385 km**



# UNIT 4 LESSON 3

## Objective M5

Use appropriate units for length estimation and measurement.

## Introducing the Lesson

Have the students recall the various metric units studied so far for measuring length. Write them on the chalkboard with their short forms.

millimetre centimetre metre kilometre  
mm cm m km

## Teaching the Lesson

Refer the class to the top of page 74. Point out these examples which can be used as an easy reference for **estimating lengths**.

thickness of dime —about 1 mm

width of thumb —about 1 cm

door knob to floor —about 1 m

Hold up various classroom objects. Ask the children to determine which unit of length one would use to measure it (millimetre, centimetre, metre). Then have the students estimate the length. Record the estimate on a chalkboard chart.

Point out the difference between an *estimate* of length and its *actual measure*. Display a metre stick (and, if possible, pass a few metre sticks to small groups of students). Demonstrate these equations with the metre stick.

$$1 \text{ cm} = 10 \text{ mm}$$

$$1 \text{ m} = 100 \text{ cm}$$

$$1 \text{ km} = 1000 \text{ m}$$

For the distance of 1 km, ask the class to imagine 1000 metre sticks laid end to end.

As each pupil looks at the metre stick in his or her group, have him or her decide on the completions of these equations.

600 cm = ■ m      metre/centimetre  
48 m = ■ cm      relationship

30 mm = ■ cm      millimetre/centimetre  
5 cm = ■ mm      relationships

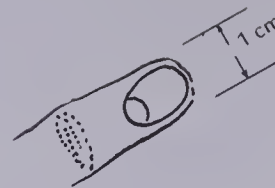
6 km = ■ m      kilometre/metre  
8000 m = ■ km      relationship

## Length

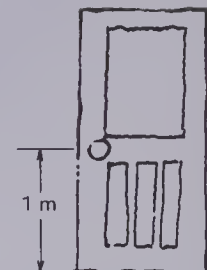
One millimetre is about the thickness of a dime.



One **centimetre** is ten millimetres.  
 $1 \text{ cm} = 10 \text{ mm}$



One **metre** is a hundred centimetres.  
 $1 \text{ m} = 100 \text{ cm}$



One **kilometre** is a thousand metres.  
 $1 \text{ km} = 1000 \text{ m}$



## EXERCISES

What unit of length would you use to measure:

- the thickness of a quarter? **mm**
- the length of a shoe? **cm**
- the width of a vegetable patch? **m**
- the height of a tree? **m**
- the distance from Halifax to St. John's? **km**

Copy and complete the equations.

- |   |   |  |
|---|---|--|
| 6. $1 \text{ cm} = \blacksquare \text{ mm}$<br><b>10</b>    | 7. $1 \text{ m} = \blacksquare \text{ cm}$<br><b>100</b>    | 8. $1 \text{ km} = \blacksquare \text{ m}$<br><b>1000</b>    |
| 9. $2 \text{ cm} = \blacksquare \text{ mm}$<br><b>20</b>    | 10. $5 \text{ m} = \blacksquare \text{ cm}$<br><b>500</b>   | 11. $3 \text{ km} = \blacksquare \text{ m}$<br><b>3000</b>   |
| 12. $19 \text{ cm} = \blacksquare \text{ mm}$<br><b>190</b> | 13. $12 \text{ m} = \blacksquare \text{ cm}$<br><b>1200</b> | 14. $15 \text{ km} = \blacksquare \text{ m}$<br><b>15000</b> |

74

## Using the Exercises

- Questions 1 to 5 require the choosing of the most appropriate unit of measure. These questions could be done orally and reinforced by other similar examples.
- Questions 6 to 14 require the understanding of relationships between the units of measure. Questions 6, 7, and 8 require the completing of equations that express these relationships.

## PRACTICE

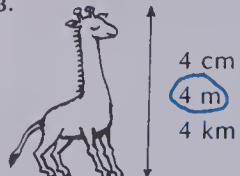
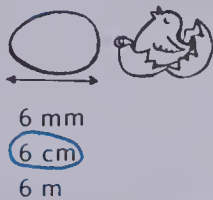
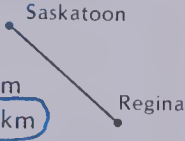
Write mm, cm, m, or km to complete each sentence.

- The horse ran 1  $\blacksquare$  in about one minute.  $\text{km}$
- The swimming pool is 3  $\blacksquare$  deep.  $\text{m}$
- The tulip is 40  $\blacksquare$  high.  $\text{cm}$
- Montreal is about 500  $\blacksquare$  from Toronto.  $\text{km}$
- The pin is 25  $\blacksquare$  long.  $\text{mm}$
- The distance around the world is about 40 000  $\blacksquare$ .  $\text{km}$

Copy and complete the equations.

- $1 \blacksquare = 10 \text{ mm}$   $\text{cm}$
- $1 \blacksquare = 100 \text{ cm}$   $\text{m}$
- $1 \blacksquare = 1000 \text{ m}$   $\text{km}$
- $4 \blacksquare = 40 \text{ mm}$   $\text{cm}$
- $6 \blacksquare = 600 \text{ cm}$   $\text{m}$
- $9 \blacksquare = 9000 \text{ m}$   $\text{km}$

Choose the best measurement.

-  4 cm  
4 m  
4 km
-  6 mm  
6 cm  
6 m
-  260 m  
260 km

Estimate. Check your answer.

- your height
- the length of your arm
- the width of your thumb
- the length of your neck
- how far you can jump

Answers vary.

	Estimate	Measure

## Metric Combinations

Copy and complete the equations.

- $2 \text{ cm} + 3 \text{ mm} = \blacksquare \text{ mm}$  23
- $21 \text{ cm} + 18 \text{ mm} = \blacksquare \text{ mm}$  228
- $6 \text{ m} + 32 \text{ cm} = \blacksquare \text{ cm}$  632
- $13 \text{ m} + 6 \text{ cm} = \blacksquare \text{ cm}$  1306
- $5 \text{ km} + 306 \text{ m} = \blacksquare \text{ m}$  5306
- $21 \text{ km} + 18 \text{ m} = \blacksquare \text{ m}$  21 018

75

## Assigning the Practice

Minimum: 1-20

Average: 1-20

Enriched: 1-20

## Reinforcement

Provide several different work cards at the classroom Measurement Centre for tasks such as these.

a. From a set of numbered books, the student first estimates and then measures the lengths and widths. The steps should be recorded on paper in chart form.

Books	Estimate	Measure
1	L = 20 cm	L = 26 cm
	W = 20 cm	W = 26 cm

b. From a list of numbered classroom objects, the student first estimates and then measures their lengths.

## Enrichment

1. Before assigning *Metric Combinations* at the bottom of page 75, practise a few similar questions orally. The students need to realize that in each addition question only one of the addends needs to be changed.

2. Ask the students to trace each other's bodies on mural paper. After the bodies have been cut out, they can be mounted on the wall. Measurements can then be taken of body parts (arm, leg, foot, etc.). Stories can also be written about body size.

3. Encourage the students to estimate and record the actual distances travelled for a few car trips. Have them record in chart form:

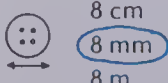
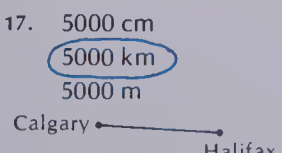

- the estimate,
- the odometer readings,
- the total distance travelled.

## Extra Practice

Copy and complete each equation.

- $3 \text{ cm} = \underline{30} \text{ mm}$
- $5 \text{ km} = \underline{5000} \text{ m}$
- $9 \text{ m} = \underline{900} \text{ cm}$
- $400 \text{ cm} = \underline{4} \text{ m}$
- $120 \text{ mm} = \underline{12} \text{ cm}$
- $8000 \text{ m} = \underline{8} \text{ km}$
- $\underline{7} \text{ cm} = 70 \text{ mm}$
- $\underline{5} \text{ km} = 5000 \text{ m}$
- $\underline{3} \text{ m} = 300 \text{ cm}$
- $\underline{9000} \text{ m} = 9 \text{ km}$
- $\underline{450} \text{ mm} = 45 \text{ cm}$
- $\underline{800} \text{ cm} = 8 \text{ m}$
- $740 \text{ mm} = \underline{74} \text{ cm}$
- $\underline{9} \text{ m} = 900 \text{ cm}$
- $12 \text{ km} = \underline{12\ 000} \text{ m}$

Choose the closest measurement.

-  8 cm  
8 mm  
8 m
-  5000 cm  
5000 km  
5000 m
-  1 m  
1 cm  
1 km

## Worksheet M5

Pages 74-75

# UNIT 4 LESSON 4

## Objective M6

Understand and apply the concept of perimeter.

## Introducing the Lesson

Prepare a display of various *polygons* (triangles, quadrilaterals, pentagons, hexagons, etc.). Discuss the characteristics of these shapes. Especially stress squares, which have four sides of equal length, and rectangles, which have two sets of equal sides.

## Teaching the Lesson

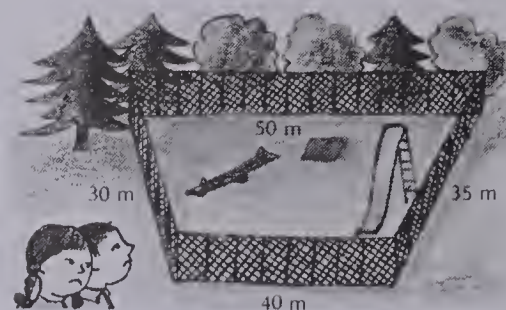
Introduce the word **perimeter** and explain that it is the measured *distance around the edge of a polygon* (per-**RIM**eter). Show one of the polygons discussed above and explain that its perimeter would be found by adding the measured lengths of its sides. Have a student measure the sides while another student records the lengths on the chalkboard. A third student can add to find the perimeter.

Proceed in a similar manner to find the perimeter of the other polygons. Point out that in some cases not all sides need to be measured. See if the students can determine on their own that on a square only one side need be measured and that on a rectangle only two sides need be measured.

Relate perimeter to fencing around land. Read and discuss the problem described on page 76. Point out that only *closed* figures have a perimeter. Also stress that before one adds the measured lengths of the sides, one must make sure all the units of measurement are the same. Once the perimeter is found, it is labelled with the proper unit.

## Perimeter

At the park today, Frank and Eva found that their favourite play area had been fenced off. Puzzled, they walked all the way around the enclosure. How far did they walk?



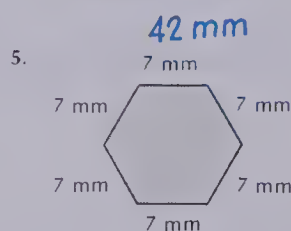
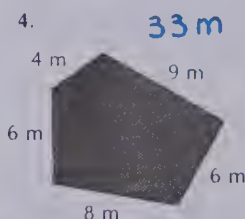
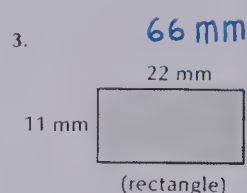
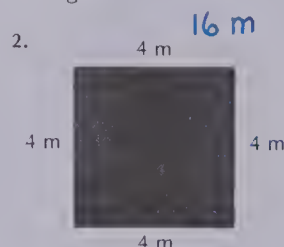
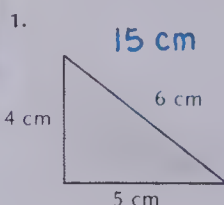
$$\begin{array}{r} 30\text{ m} + 50\text{ m} + 35\text{ m} + 40\text{ m} \\ 30\text{ m} \\ 50\text{ m} \\ 35\text{ m} \\ + 40\text{ m} \\ \hline 155\text{ m} \end{array}$$

They walked 155 m.

The distance around a figure is called the **perimeter**.

## EXERCISES

What is the perimeter of each figure?



76

## Using the Exercises

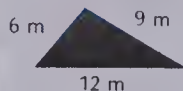
- Questions 1 to 6 involve finding the perimeters of various polygons. Before the students begin working, have them find the square and the rectangle. Question 2 is a square, since all sides have the same length. Question 3 is a rectangle, since the opposite sides are of the same length.



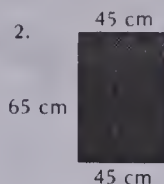
## PRACTICE

What is the perimeter of each figure?

1. **27m**



2.



**220 cm**

3.



**38 km**

4.



**248 cm**

Measure each side. What is the perimeter of the figure?

5.



**6cm**

6.



**6cm**

7.



**12 cm**

Solve.

8. Tape is to be placed around a window which is 3 m by 2 m. How many metres of tape are needed? **10 cm**

## REVIEW

M3

1. Name an object that is about 1 mm thick.  
2. What unit of length is 10 mm long? **1 cm** Example: a dime

M4

3. Name 2 places in your neighbourhood that are about 1 km apart. **Answers vary.**  
4. How many metres are there in a kilometre? **1000 m**

M5

5. Estimate the length of your desk in centimetres. **Answers vary.**  
6. Estimate the width of your classroom in metres. **Answers vary.**

What is the perimeter of each figure?

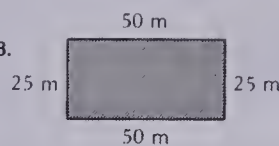
M6

7.



**735 km**

8.



**150 m**

77

## Assigning the Practice

Minimum: 1-7

Average: 1-8

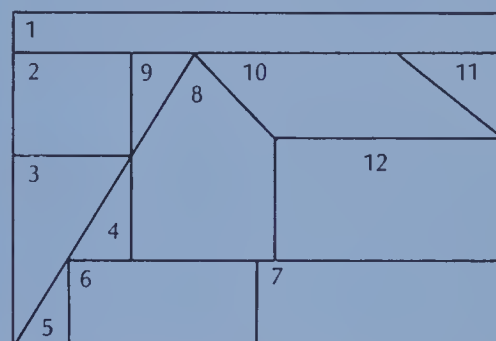
Enriched: 1-8

## Review Exercises

Questions	Objective	Pages
1-2	M3	70-71
3-4	M4	72-73
5-6	M5	74-75
7-8	M6	76-77

## Reinforcement

Divide the students into groups of four. Pass each group a centimetre ruler, a pair of dice, and a perimeter board (as shown below). Each player in turn tosses the dice to locate a polygon of the same number. He or she then measures and finds the perimeter of the polygon. If correct, the player adds this perimeter to his score. The first player to reach 180 wins.



## Enrichment

1. Prepare problem-solving work cards involving perimeters for the Measurement Centre.

Make a square with a perimeter of 20 cm.

Make a rectangle with a perimeter of 30 cm.

A triangle has a perimeter of 28 cm. If one side is 15 cm and another side is 7 cm, what is the length of the third side?

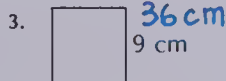
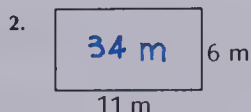
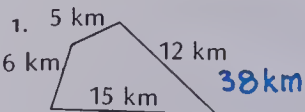
A pentagon has a perimeter of 45 cm. If four sides are 12 cm, 9 cm, 8 cm, and 10 cm, what is the length of the fifth side?

2. Assign simple perimeter problems in which the measurements are not in the same unit. (Rectangle: 2 m long, 150 cm wide)

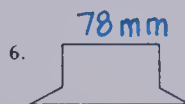
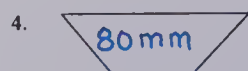
3. Have the students work in groups of two or three to measure large perimeters in the school, e.g., classroom floor, gym floor, hallway, stage, playground, and so on.

## Extra Practice

What is the perimeter of each figure?



Measure each side. What is the perimeter of each figure?



Find the perimeters.

7. Square: 5 cm wide **20 cm** 8. Rectangle: 4 cm wide, 6 cm long **20 cm**  
9. Square: 12 km wide **48 km** 10. Rectangle: 9 km wide, 20 km long **58 km**  
11. Square: 22 m wide **88 m** 12. Rectangle: 9 m wide, 12 m long **42 m**  
13. Square: 110 cm wide **440 cm** 14. Rectangle: 40 cm wide, 55 cm long **190 cm**

## Worksheet M6

Pages 76-77

# UNIT 4 LESSON 5

## Objective M7

Recognize and use the gram and kilogram as units of mass.

## Introducing the Lesson

Discuss the everyday uses of mass (pricing of meat, vegetables, fruit, cheese, etc.). If possible, display several household items (box of laundry detergent, tub of honey, bag of potatoes, etc.). Point out that the two units for mass measurement most frequently used are the **gram** and the **kilogram**.

Distribute centicubes, interlocking cubes having a length of 1 cm and a mass of 1 g, so that students can feel 1 g. Raisins can also be used, as the mass of a raisin is about 1 g. Pass around a book or some other object having a mass of 1 kg so that the students can feel 1 kg and compare it to 1 g.

## Teaching the Lesson

Read and discuss the story on page 78. Make up an object of 85 centicubes. This can represent the mass of the bird. Pass around the object so that everyone can feel the mass.

If possible, have balance scales and a floor scale available so that the students can gain experience measuring mass. *Estimates* of the mass of various classroom objects should be made first and then actual measurements made. *Comparisons* (heavier than, lighter than) also should be made. Be sure the students can read the scales and write their findings properly.

After measuring the mass of smaller objects, the students could measure their body masses. These measuring activities will give the students a basis for *estimating masses*. It is important for the students to learn "benchmarks" to use as references: e.g., a raisin is about 1 g, a dictionary is about 1 kg.

## Mass

Li found an injured bird and nursed it back to health. He asked the vet to measure its mass each week.

The bird's mass was 85 g.

Very light things are measured in **grams**.

The mass of a raisin is about 1 g.

Heavier things are measured in **kilograms**.

The mass of five large apples is about 1 kg.

The mass of a dictionary is about 1 kg.



$$1 \text{ kg} = 1000 \text{ g}$$

## EXERCISES

Write **g** or **kg** to name the better unit to measure each object.

- |                      |                      |                      |
|----------------------|----------------------|----------------------|
| 1. a penny <b>g</b>  | 2. a dog <b>kg</b>   | 3. a straw <b>g</b>  |
| 4. a child <b>kg</b> | 5. a crayon <b>g</b> | 6. a horse <b>kg</b> |

Write the total mass in kilograms or grams.

- |                 |                |                  |
|-----------------|----------------|------------------|
| 7. <b>35 kg</b> | 8. <b>16 g</b> | 9. <b>1150 g</b> |
|-----------------|----------------|------------------|

Write the mass of each object.

- |                |                  |                  |
|----------------|------------------|------------------|
| 10. <b>1 g</b> | 11. <b>35 kg</b> | 12. <b>500 g</b> |
|----------------|------------------|------------------|

78

## Using the Exercises

- Questions 1 to 6 involve choosing the more appropriate mass unit for measuring.
- Questions 7 to 9 deal with adding masses. Question 9 involves changing kilograms to grams before adding.
- Questions 10 to 12 involve reading mass measurement scales properly. Readings are given in grams and kilograms.

## PRACTICE

Choose the best answer.



1 g 10 g 1 kg



200 g 200 kg 2000 kg



2 g 20 g 200 g



5 g 50 g 5 kg



30 g 300 g 3 kg



70 g 700 g 7 kg

Find the mass.

7.  $16 \text{ kg} + 32 \text{ kg} = 48 \text{ kg}$  8.  $375 \text{ kg} + 468 \text{ kg} = 843 \text{ kg}$  9.  $5083 \text{ kg} - 4739 \text{ kg} = 344 \text{ kg}$

10.  $47 \text{ g} - 25 \text{ g} = 22 \text{ g}$  11.  $826 \text{ g} + 317 \text{ g} = 1143 \text{ g}$  12.  $6713 \text{ g} - 3456 \text{ g} = 3257 \text{ g}$

Write the mass in grams.

13.  $2 \text{ kg} + 300 \text{ g} = 2300 \text{ g}$  14.  $5 \text{ kg} + 20 \text{ g} = 5020 \text{ g}$  15.  $1 \text{ kg} + 1 \text{ g} = 1001 \text{ g}$

16.  $3 \text{ kg} + 13 \text{ g} = 3013 \text{ g}$  17.  $1 \text{ kg} + 987 \text{ g} = 1987 \text{ g}$  18.  $10 \text{ kg} + 800 \text{ g} = 10800 \text{ g}$

Solve.

19. At a fruit and vegetable stand Frances bought 5 kg of apples, 10 kg of potatoes, and 3 kg of tomatoes. What was the total mass of her purchases?  $18 \text{ kg}$

20. Steve made a bowl of mixed nuts for a Christmas treat. He used 340 g of peanuts, 170 g of cashews, and 85 g of macadamia nuts. How many grams of nuts did he use?  $595 \text{ g}$

## Overloaded?

Andy's father loaded fifteen 20 kg bags of fertilizer in his station wagon. His own mass is 100 kg. Did he exceed the 600 kg load limit for the station wagon?  $\text{no}$

$600 - 400 = 200$

79

## Assigning the Practice

Minimum: 1-15

Average: 1-20

Enriched: 1-20

## Reinforcement

1. Assign *Overloaded?*, page 79. Students can draw a picture to better visualize the problem.

2. At the Measurement Centre, have 10 identical glass jars filled with natural items (e.g., top soil, dandelion blossoms, grass, sand, pebbles, air, seeds, water, leaves, pine needles) ask the students to: a. estimate their masses, b. arrange them in order from heaviest to lightest, c. measure the masses, and d. record the masses.

3. Ask the students to bring a bag containing a quantity of something that they think totals a mass of 1 kg.

4. Write on the board the equation:

$1000 \text{ g} = 1 \text{ kg}$

Have the students practise changing from one mass unit to another and adding two masses. Particular attention should be given to the addition of two different mass units.

$5 \text{ kg} + 37 \text{ g} = 5000 \text{ g} + 37 \text{ g} = 5037 \text{ g}$

## Enrichment

1. Discuss favourite animals with the class. Ask that each student draw a picture of and do research on the mass of his or her favourite animal. Make a bulletin board display of these animals and their masses.

2. Develop a bar graph of the above animal mass information.

3. Keep an on-going list in the classroom of items one buys at the store by mass. The students are to supply all the information for the list.

## Extra Practice

## Worksheet M7

Pages 78-79

Estimate and then measure the mass of these objects.

	Estimate	Actual
1. Eraser		
2. Pencil		
3. Math book		

	Estimate	Actual
4. Shoe		
5. Glass		
6. Cookie		

Find the sum in grams or kilograms.

7.  $35 \text{ g} + 85 \text{ g} = 120 \text{ g}$  8.  $267 \text{ g} + 137 \text{ g} = 404 \text{ g}$  9.  $150 \text{ g} + 423 \text{ kg} = 423150 \text{ g}$

10.  $9 \text{ kg} + 59 \text{ g} = 9059 \text{ g}$  11.  $345 \text{ g} + 4 \text{ kg} = 4345 \text{ g}$  12.  $5 \text{ kg} + 5 \text{ g} = 5005 \text{ g}$

Solve.

13. It costs 35¢ to send a 15 g letter to England by air mail, 63¢ to mail a 42 g letter, and 63¢ to mail a 48 g letter. How much does it cost to send all three letters?  $\$1.61$



# UNIT 4 LESSON 6

## Objective M8

Convert cents to dollars and dollars to cents.

## Introducing the Lesson

Begin a discussion of the students' everyday uses of money (bus fare, lunch, snacks, sports, movies, fees, fines, etc.). Ask the students for specific examples of how much they spend for their own needs. As these examples are given, record them on the chalkboard.

snacks: 25¢  
bus fare: 65¢  
movie: \$3.50

## Teaching the Lesson

Read and discuss the money story on page 80. Have the students recall the two ways of writing amounts of money (with a dollar sign and with a cent sign). Review the place value when money is written with the dollar sign. Point out that the decimal point separates the **dollars** from the **cents**.

\$ 2 5 • 1 5  
ten dollars   one dollar   dimes   pennies

Go back to the chalkboard list of the students' expenditures and ask a student to write the amounts of money that were recorded with a cent sign using a dollar sign.

snacks: 25¢ or \$0.25  
bus fare: 65¢ or \$0.65

The expenditures that were recorded with a dollar sign can be written using a cents sign.

movie: \$3.50 or 350¢

Practise several similar examples requiring the pupils to write money with either a dollar or a cents sign.

Help the students to practise rounding money to the nearest dollar. This rule is helpful: "If there is less than 50¢, write the dollar value as it is; if there is 50¢ or more, increase the dollar value by 1."

## Money

George and Judy had an argument in the store  
George said \$0.78 was more than 78¢. Judy said 78¢ was more than \$0.78. Who was right?

They were both wrong



$$78¢ = \$0.78$$

dollars   cents  
\$0.78

In the number \$0.78, there are 0 dollars and 78 cents.

## EXERCISES

Write each amount as you would say it.

1. 34¢      2. 56¢      3. \$2.15      4. \$1.29      5. \$3.30
6. \$3.03      7. \$0.68      8. \$0.40      9. \$0.04      10. \$0.09

Write each amount as a numeral with a dollar sign.

11. 3 dollars and 12 cents      \$3.12      12. 15 dollars and 40 cents      \$15.40
13. 24 dollars and 4 cents      \$24.04      14. 26 cents      \$0.26
15. ninety cents      \$0.90      16. nine cents      \$0.09

Write each amount as a numeral with a cent sign.

17. fifty-two cents      52¢      18. 1 quarter 1 penny      26¢      19. three quarters      75¢
20. six cents      6¢      21. sixty cents      60¢      22. \$2.00      200¢

Write each amount as a numeral with a dollar sign.

23. 37¢      \$0.37      24. 75¢      \$0.75      25. 123¢      \$1.23      26. 4¢      \$0.04      27. 60¢      \$0.60

Write each amount as a numeral with a cent sign.

28. \$0.14      14¢      29. \$0.40      40¢      30. \$0.04      4¢      31. \$1.40      140¢      32. \$0.06      6¢

80

## Using the Exercises

- Questions 1 to 10 require an understanding of the two ways money can be written. The answers need only the words "cents" and/or "dollars".
- Questions 11 to 16 reverse the former process, asking for an answer with a dollar sign.
- Questions 17 to 22 involve changing words or dollar amounts of money to cents.
- Questions 23 to 32 require changing from cents to dollars and cents, or vice versa.
- As the students are doing these exercises, especially check that they write amounts less than ten cents properly with the dollar sign.

## PRACTICE

Write each amount as a numeral with a dollar sign

1. 23¢ **\$0.23**    2. 58¢ **\$0.58**    3. 86¢ **\$0.86**    4. 8¢ **\$0.08**    5. 60¢ **\$0.60**


Write each amount as a numeral with a cents sign

6. \$0.39 **39¢**    7. \$0.77 **77¢**    8. \$0.97 **97¢**    9. \$0.07 **7¢**    10. \$0.70 **70¢**

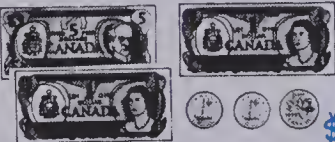

Write each sum in dollars.

11.  $\$4 + 7¢$  **\$4.07**    12.  $\$7 + 32¢$  **\$7.32**    13.  $\$39 + 24¢$  **\$39.24**    14.  $\$87 + 72¢$  **\$87.72**

How much money? Write the amount in cents

15.  **87¢**    16.  **53¢**

How much money? Write the amount in dollars

17.  **\$7.21**    18.  **\$11.55**

Round to the nearest dollar.

19. \$0.72 **\$1.00**    20. \$6.07 **\$6.00**    21. \$18.50 **\$19.00**    22. \$93.40 **\$93.00**

Solve.

23. Brenda has a \$5 bill, a \$2 bill, a \$1 bill, 2 quarters, 3 dimes, 4 nickels, and 7 pennies in her wallet.  
How much money does she have? **\$9.07**

## Change Challenge

Jim has 26¢ in change.  
What coins could he have?  
There are 13 possibilities.  
How many can you find?

Examples: 26 pennies  
21 pennies, 1 nickel  
16 pennies, 2 nickels



81

## Assigning the Practice

Minimum: 1-10, 15-18

Average: 1-23

Enriched: 1-23

## Reinforcement

1. Assign *Change Challenge*, page 81, to all students. Most students will be able to find some of the possibilities; better students will find all.

2. Prepare the following kinds of activity cards for the classroom Measurement Centre.

a. Show all the ways you can make 21¢, 59¢, \$0.35, and \$0.90 using Canadian money rubber stamps.

b. Show sixty-nine cents, forty-five cents, etc., using money stamps. Then write the amounts of money in cents and also in dollars and cents.

## Enrichment

1. Assign research topics on Canadian coins and bills. Have a small group of students prepare a display showing, for example, the obvious characteristics of various bills.

2. Ask the students to cut pictures of interesting items out of old catalogs and paste them on paper. Direct the students to round the price of each item to the nearest dollar.

## Extra Practice

## Worksheet M8

Pages 80-81

Write each amount in dollars.

1. 5¢ = **\$0.05**    2. 34¢ = **\$0.34**    3. 157¢ = **\$1.57**

Write each amount in cents.

4. \$0.26 = **26¢**    5. \$0.09 = **9¢**    6. \$1.25 = **125¢**

Express each sum in dollars.

7.  $\$6 + 82¢$  = **\$6.82**    8.  $\$4 + 5¢$  = **\$4.05**    9.  $\$42 + 17¢$  = **\$42.17**

Round to the nearest dollar.

10. \$7.38 = **\$7.00**    11. \$8.67 = **\$9.00**    12. \$80.50 = **\$81.00**

13. What is the value of three \$20.00 bills, plus one \$10.00 bill, plus one \$2.00 bill, plus three quarters and two dimes? **\$72.95**

# UNIT 4 LESSON 7

## Objective M9

Add or subtract money up to \$99.99.

## Introducing the Lesson

Discuss everyday situations that require addition or subtraction with money (calculating earnings from babysitting or lawn cutting, tallying savings in a bank, buying items and receiving change, etc.). Devise a few problems from these situations and ask the class to decide whether they would add or subtract to solve them. The students can then be encouraged to devise problems for each other to decide on the operation necessary to solve them.

## Teaching the Lesson

Read and discuss the problems on page 82. Use play money as the pupils act out each situation. Write the addition and subtraction on the chalkboard. Review the proper placement of the decimal point, which separates the dollars from the cents and the dollar sign.

Set up other situations (such as those discussed in Introducing the Lesson) and have the students act them out with play money. Have a student record the additions and/or subtractions required for the solutions on the chalkboard. Encourage estimation as a way of checking the reasonableness of answers. Problem situations could include:

1. Mary collects \$12.25 babysitting money. She spends \$9.95 on a new T-shirt. How much is left?
2. George earns \$15 cutting grass. He puts it in his savings account which has \$62.55. How much money is now in his account?

Distribute price tags (hand made) to groups of two or three students. Ask them to devise one addition and one subtraction word problem using the amounts on the price tags. Each group can then choose one problem for the rest of the class to solve right away. The other problem can be written on a stiff card, the price tags glued on it, and displayed in the classroom.

## Adding and Subtracting with Money

Ursula's mother bought the groceries for a long weekend at the cottage. She spent \$54.35 before they left home and \$28.46 after they got to the cottage. How much did she spend altogether?

$$\begin{array}{r} \$54.35 \\ + 28.46 \\ \hline \end{array}$$

Add.

Write the dollar sign and decimal point in your answer.

She spent \$82.81 altogether.

Ursula's dad filled up his gas tank for \$17.40 at a city discount centre. He paid \$19.25 for the same amount of gas near the cottage. How much did he save by buying gas at the discount centre?

$$\begin{array}{r} \$19.25 \\ - 17.40 \\ \hline \end{array}$$

Subtract.

Write the dollar sign and decimal point in your answer.

The amount he saved was \$1.85.

## EXERCISES

Add.

1. \$3 + 8 \$11	2. \$3.00 + 8.00 \$11.00	3. \$0.52 + 0.34 \$0.86	4. \$3.52 + 8.34 \$11.86	5. \$54.78 + 23.45 \$78.23
-----------------------	--------------------------------	-------------------------------	--------------------------------	----------------------------------

Subtract.

6. \$9 - 6 \$3	7. \$9.00 - 6.00 \$3.00	8. \$0.68 - 0.35 \$0.33	9. \$9.68 - 6.35 \$3.33	10. \$74.23 - 31.85 \$42.38
----------------------	-------------------------------	-------------------------------	-------------------------------	-----------------------------------

Add or subtract.

11. \$4.52 + 3.39 \$7.91	12. \$9.62 - 4.38 \$5.24	13. \$2.73 + 5.81 \$8.54	14. \$8.47 - 2.65 \$5.82	15. \$27.31 + 51.82 \$79.13
--------------------------------	--------------------------------	--------------------------------	--------------------------------	-----------------------------------

82

## Using the Exercises

- Questions 1 to 5 and 6 to 10 lead the student through all the steps of an addition and of a subtraction problem involving dollars and cents.
- Questions 11 to 15 require that the student watch the signs carefully before adding or subtracting.



## PRACTICE

Add.

- |   |   |   |  |   |
|---|---|---|--|---|
| 1. $\begin{array}{r} \$3 \\ + 6 \\ \hline \$9 \end{array}$          | 2. $\begin{array}{r} \$70 \\ + 13 \\ \hline \$83 \end{array}$       | 3. $\begin{array}{r} \$38 \\ + 38 \\ \hline \$76 \end{array}$       | 4. $\begin{array}{r} \$42.00 \\ + 37.00 \\ \hline \$79.00 \end{array}$ | 5. $\begin{array}{r} \$5.02 \\ + 5.57 \\ \hline \$10.59 \end{array}$  |
| 6. $\begin{array}{r} \$0.43 \\ + 0.06 \\ \hline \$0.49 \end{array}$ | 7. $\begin{array}{r} \$0.35 \\ + 3.21 \\ \hline \$3.56 \end{array}$ | 8. $\begin{array}{r} \$4.54 \\ + 3.27 \\ \hline \$7.81 \end{array}$ | 9. $\begin{array}{r} \$1.30 \\ + 7.89 \\ \hline \$9.19 \end{array}$    | 10. $\begin{array}{r} \$3.62 \\ + 9.19 \\ \hline \$12.81 \end{array}$ |

Subtract.

- |  |  |  |   |   |
|--|--|--|---|---|
| 11. $\begin{array}{r} \$7 \\ - 2 \\ \hline \$5 \end{array}$          | 12. $\begin{array}{r} \$14 \\ - 7 \\ \hline \$7 \end{array}$         | 13. $\begin{array}{r} \$97 \\ - 12 \\ \hline \$85 \end{array}$       | 14. $\begin{array}{r} \$83 \\ - 29 \\ \hline \$54 \end{array}$          | 15. $\begin{array}{r} \$64.00 \\ - 21.00 \\ \hline \$43.00 \end{array}$ |
| 16. $\begin{array}{r} \$0.77 \\ - 0.34 \\ \hline \$0.43 \end{array}$ | 17. $\begin{array}{r} \$0.91 \\ - 0.63 \\ \hline \$0.28 \end{array}$ | 18. $\begin{array}{r} \$8.40 \\ - 2.24 \\ \hline \$6.16 \end{array}$ | 19. $\begin{array}{r} \$91.49 \\ - 20.65 \\ \hline \$70.84 \end{array}$ | 20. $\begin{array}{r} \$71.44 \\ - 32.27 \\ \hline \$39.17 \end{array}$ |

Add or subtract.

- |   |   |   |   |   |
|---|---|---|---|---|
| 21. $\begin{array}{r} \$7.72 \\ + 2.91 \\ \hline \$10.63 \end{array}$ | 22. $\begin{array}{r} \$14.50 \\ + 23.62 \\ \hline \$38.12 \end{array}$ | 23. $\begin{array}{r} \$34.27 \\ - 16.90 \\ \hline \$17.37 \end{array}$ | 24. $\begin{array}{r} \$57.72 \\ + 19.60 \\ \hline \$77.32 \end{array}$ | 25. $\begin{array}{r} \$78.24 \\ - 31.81 \\ \hline \$46.43 \end{array}$ |
|---|---|---|---|---|

Solve.

26. John's family ate in restaurants while they were on vacation. One day they spent \$32.53 for lunch and \$68.27 for dinner. How much did they spend altogether? \$100.80
27. During the off-season a cottage can be rented for \$48.90 a day. In high season the rent is \$67.80 \$18.90 a day. How much is saved per day in the off-season?

## Gertie's Guessing Game

Gertrude has 13 bills and coins.

She has \$20.15 altogether.

How many of each bill and coin does Gertie have?

Examples: ten \$2, three nickels  
 nine \$2, two \$1, one dime, one nickel  
 two \$5, five \$2, one dime, five pennies

83

## Assigning the Practice

Minimum: 1-27, odd numbers only

Average: 1-27

Enriched: 1-27

## Reinforcement

Prepare the following activity cards for the Measurement Centre.

a. Using the menu order forms from drive-in restaurants (these are surprisingly easy to get!), make out several different orders. Only one of each item should be ordered. The students are waitresses or waiters and must total the cost of each order. Some cards could also ask for the change one would get for an order if paid with a five dollar bill.

b. If you use 4 specified store discount coupons, how much money would you save?

## Enrichment

1. Assign *Gertie's Guessing Game*, page 83. Some students may find this easier to solve with the aid of play money.

2. Ask the students to record the money they receive (or would like to receive) in one week, along with their expenditures. Have them add and subtract, as needed, each day for one week to find their week-end total.

3. Ask the students to prepare shopping lists of several grocery items from newspaper ads and to total the amount of money needed to buy them.

## Extra Practice

## Worksheet M9

Pages 82-83

Add.

- |   |  |  |   |
|---|--|--|---|
| 1. $\begin{array}{r} \$5.37 \\ + 0.41 \\ \hline \$5.78 \end{array}$ | 2. $\begin{array}{r} \$7.82 \\ + 6.09 \\ \hline \$13.91 \end{array}$ | 3. $\begin{array}{r} \$5.99 \\ + 8.95 \\ \hline \$14.94 \end{array}$ | 4. $\begin{array}{r} \$46.35 \\ + 7.27 \\ \hline \$53.62 \end{array}$ |
|---|--|--|---|

Subtract.

- |   |   |   |   |
|---|---|---|---|
| 5. $\begin{array}{r} \$8.43 \\ - 0.27 \\ \hline \$8.16 \end{array}$ | 6. $\begin{array}{r} \$7.38 \\ - 5.19 \\ \hline \$2.19 \end{array}$ | 7. $\begin{array}{r} \$4.00 \\ - 1.95 \\ \hline \$2.05 \end{array}$ | 8. $\begin{array}{r} \$66.71 \\ - 7.64 \\ \hline \$59.07 \end{array}$ |
|---|---|---|---|

Add or subtract.

- |                                |                                    |                                    |  |
|--------------------------------|------------------------------------|------------------------------------|--|
| 9. $\$4.37 + \$3.48 = \$7.85$  | 10. $\$67.49 - \$35.88 = \$31.61$  | 11. $\$40.00 - \$19.95 = \$20.05$  |  |
| 12. $\$8.73 - \$4.55 = \$4.18$ | 13. $\$73.12 + \$35.39 = \$108.51$ | 14. $\$74.25 + \$69.86 = \$144.11$ |  |

Solve.

15. Tim made long distance calls costing \$15.76 and \$20.65. How much did he spend altogether? \$36.41

# UNIT 4 LESSON 8

## Objective PS4

Solve simple measurement problems involving length, mass, and money.

## Introducing the Lesson

Through discussion, bring together the types of units added or subtracted to this point in the unit.

"John had 25¢. His mother gave him 20¢ more."

25¢ "Add cents to cents."  
+20¢

45¢ "You get cents."

"Alice walked 2 km north and 5 km south."

2 km "Add kilometres to  
5 km kilometres,

7 km and you get kilometres."

"Bob's mass was 60 kg. Three months after he joined the track team his mass was 50 kg."

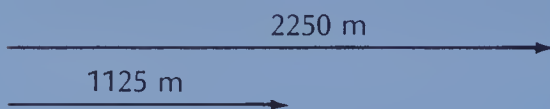
60 kg "Subtract kilograms  
-50 kg from kilograms,

10 kg and you get kilograms."

Stress that answers to measurement problems *must* be labelled with the proper unit.

## Teaching the Lesson

Read the example on page 84. Make a diagram of the situation on the chalkboard to show why we subtract to find how much farther.



Discuss the four problem-solving steps shown. For the Facts step, stress the importance of knowing the *unit* being measured and of labelling the answer with this unit in the Answer step.

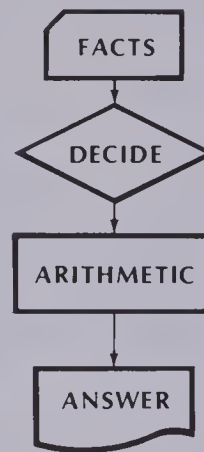
Other problems may be demonstrated for further practice. For example, show two objects and ask for the difference in their masses. Find the masses on a balance scale to get the facts. Then ask the class to **Decide** how one finds the difference. Have a student do the **Arithmetic** step on the chalkboard. Be sure that the answer is properly labelled in grams or kilograms.

## Problem Solving

Lisa and Jonah are preparing for a long race.

Lisa runs 1125 m and Jonah runs 2250 m.

How much farther does Jonah run?



Lisa runs 1125 m  
Jonah runs 2250 m.

To find **how much farther**,  
you must **subtract**.

$$\begin{array}{r} 2250 \\ -1125 \\ \hline 1125 \end{array}$$

Jonah runs 1125 m farther  
than Lisa

## EXERCISES

Use the four steps to solve these problems.

1. A forest reserve has 4 sides.  
Every side is 15 km long.  
What is the perimeter of the reserve? **60 km**
2. Pam and Harry had lunch at a snack bar.  
Two hot dogs were \$1.60. **\$1.60 + \$0.90 + \$1.30 = \$3.80**  
Chips were \$0.90 and drinks were \$1.30.  
How much did lunch cost?
3. Marta kept a record of the growth of a bean plant.  
On Tuesday, it was 63 mm tall.  
On Friday, it was 78 mm tall. **15 mm**  
How much did it grow between Tuesday and Friday?

84

## Using the Exercises

- To familiarize the students with the four problem-solving steps, it might be well to do Questions 1 to 3 as a class with as much discussion as is needed.

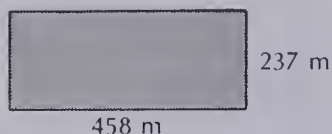
## PRACTICE

Use the four steps to solve the problems.

1. It is 16 km from the Brown's cottage to the nearest town. How far do the Brown's drive when they make a round trip? **32 km**
2. John spent the summer at his grandparent's farm. When he arrived there, his mass was 34 kg. When he left, it was 37 kg. How many kilograms did he gain? **3 kg**
3. Sophie is sewing a cross-stitch pattern on a tea towel. On Monday, the rows she finished measured 48 mm. On Tuesday she sewed 12 mm more. How many millimetres altogether has she done? **60 mm**
4. The Benson family had lunch at a restaurant. The charge for the food was \$12.10. They gave the waiter a \$1.50 tip. What was the total cost of the lunch? **\$13.60**

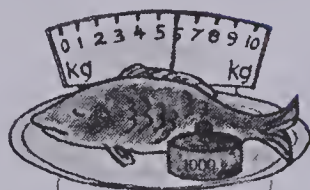
Use the facts in each picture to answer the question

5.



What is the perimeter? **1390 m**

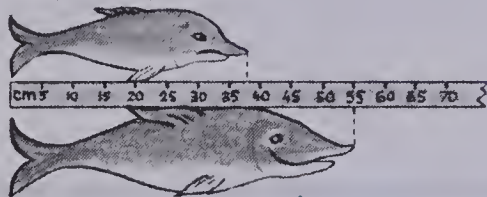
6.



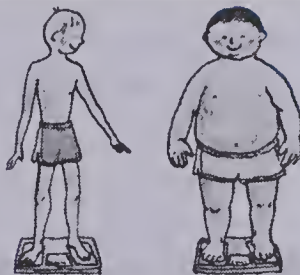
What is the fish's mass? **6 kg**

## Imagine

Make up a story problem for each picture.



**Answers vary.**



85

## Assigning the Practice

Minimum: 1, 2, 5, 6

Average: 1-6

Enriched: 1-6

## Reinforcement

1. All students may be assigned the *Imagine* exercises at the bottom of page 85. For those who have difficulty, ask them to do *Imagine* cooperatively.

2. Divide the class into groups to write word problems. Exchange the problems from this assignment with those from another class in your school. Have ready materials from which the students can devise their word problems, such as:

- a. more picture examples like the *Imagine* exercises, page 85,
- b. food ads from the newspaper,
- c. ads for household or sports items on sale,
- d. catalog pages of items sold in various metric units.

## Enrichment

Ask the students to visit a hardware store, lumber yard, or fabric store. Have them write down ten to fifteen items for sale, the various units of measurement they are sold by, and the prices. After their trip they can use these facts to devise word problems to be used at the Measurement Centre.

## Extra Practice

## Worksheet PS4

Pages 84-85

Solve.

1. Rosa bought a 55¢ ice cream cone and a 45¢ drink at a snack bar. How much did she have to pay? **\$1.00**
2. Bill went camping. His knapsack had a mass of 5 kg and his bedroll was 4 kg. His own mass was 37 kg. What was the total mass he had to move? **46 kg**
3. Lloyd drove 35 km to the store, 20 km to the market, and 40 km back home. How far did he drive altogether? **95 km**
4. The Walsh's car can carry a total of 200 kg in a roof rack. Mr. Walsh measured the mass of the parcels to go on top. They were 68 kg, 32 kg, 50 kg, and 47 kg. Was that too much? **197 kg - No**
5. What is the perimeter of Jerry's rectangular vegetable garden which measures 7 m long and 5 m wide? **24 m**

## Problem Solving Activities

Assign Level 4, Unit 3



# UNIT 4 LESSON 9

## Objective M10

Use the additive method to make change up to \$10.00.

### Introducing the Lesson

Review counting patterns, especially by 1s, 2s, 5s, 10s, and 25s. Ask individual students to count aloud a pile of nickels as another student at the chalkboard records 5¢, 10¢, 15¢...

Dimes, quarters, dollars, and two-dollar bills also can be counted in a similar manner.

10¢, 20¢, 30¢, ....

25¢, 50¢, 75¢, ....

\$2, \$4, \$6, ....

### Teaching the Lesson

Set up a "store" in the classroom with several objects priced for sale. Give a student \$2.00. Ask the student to choose an item to buy and then to pay for it. As salesclerk, give out the proper amount of change counting up to \$2.00. That is, if the cost of the item is \$1.55, you will say, "One fifty-five, one sixty (a nickel), one seventy (a dime), one seventy-five (a nickel), two dollars (a quarter)."

Repeat this procedure several times with other students. Switch. Let the students now take the role of the salesclerk. Ask that another student record the counting on the chalkboard. Point out that we generally use the *largest* coins or bills we can when making change, e.g., change for \$2.68 from \$3.00:

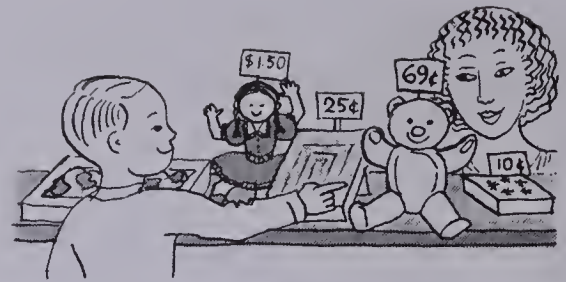
"\$2.68, \$2.70, \$2.75, \$3.00."

↑                      ↑                      ↑  
2 pennies, 1 nickel, 1 quarter

Give as many students as possible a chance to play one of the roles.

## Making Change

Peter wanted to buy the teddy bear. He had \$2.00. How much change was he supposed to receive? **\$1.31**



Justina gave the change without using a paper and pencil to subtract.

She started with 69¢, the cost of the teddy bear.

She gave Peter a penny, to make 70¢.

She added a nickel, to make 75¢,

then a quarter, to make \$1.00,

and then a \$1 bill, to make \$2.00.

Peter received a penny, a nickel, a quarter, and a \$1 bill.

His change was \$1.31.

### EXERCISES

Count:

- by cents from 76¢ to 80¢
- by cents from 31¢ to 35¢
- by nickels from 60¢ to 75¢
- by nickels from 15¢ to 25¢
- by dimes from 80¢ to \$1
- by dimes from 10¢ to 50¢
- by quarters from 25¢ to \$1
- by quarters from 50¢ to \$1
- by \$1 bills from \$3 to \$5
- by \$1 bills from \$7 to \$10
- by \$2 bills from \$1 to \$5
- by \$5 bills from \$5 to \$10

Count the change.

- for 19¢ from 25¢ **6¢**
- for 32¢ from 50¢ **18¢**
- for 64¢ from \$1.00 **36¢**
- for 77¢ from \$1.00 **23¢**
- for \$1.35 from \$2.00 **65¢**
- for \$1.45 from \$2.00 **55¢**
- for \$3.98 from \$5.00 **\$1.02**
- for \$7.75 from \$10.00 **\$2.25**
- for \$2.37 from \$5.00 **\$2.63**
- for \$8.31 from \$10.00 **\$1.69**

86

### Using the Exercises

- Questions 1 to 12 involve counting by 1s, 2s, 5s, 10s and 25s with coins and bills. See that the students label their counting with either the cent sign or the dollar sign.
- Questions 13 to 22 require writing down what would be said as the change is counted out. Remind the students to use the *largest* possible coins and bills.

## PRACTICE





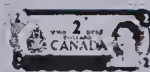


Complete each pattern.

- 4, 5, 6, 7, 8, 9, 10
- 35, 40, 45, 50, 55, 60, 65
- 30, 40, 50, 60, 70, 80, 90, 100
- 25, 50, 75, 100
- 80, 85, 90, 95, 100
- 70, 71, 72, 73, 74, 75

Express each amount in another way.

- $25¢ = 17¢ + 1 \text{ penny} + 1 \text{ nickel}$
- $50¢ = 26¢ + 1 \text{ penny} + 1 \text{ dime}$
- $\$1.00 = 65¢ + 1 \text{ nickel} + 3 \text{ dimes}$
- $\$1.00 = 71¢ + 4 \text{ pennies} + 1 \text{ quarter}$
- $\$1.00 = 40¢ + 1 \text{ dime} + 2 \text{ quarters}$
- $\$2.00 = \$1.39 + 1 \text{ penny} + 1 \text{ dime} + 2 \text{ quarters}$

Draw a picture to show the change.

- Note Pad, 43¢, 57¢, 
-  200 Pieces, \$3.57, \$1.43, 
-  \$1.69, \$0.31, 
-  \$2.29, \$7.71, 

Solve.

- Helen's father bought fish and chips for dinner for \$7.36. He gave the clerk \$10.00. Count out the change he should get back. \$2.64
- Mario's mother paid \$8.65 for gas for the car. She gave the attendant a \$10 bill. Count out the change she should get back. \$1.35

## Rope It Off

A boxing ring is about 6 m square.

If there are 3 ropes around the ring, what is the total length of this rope? 72 m



87

## Assigning the Practice

Minimum: 1-16

Average: 1-18

Enriched: 1-18

## Reinforcement

1. Assign *Rope It Off*, page 87. For those having difficulty, recall that in finding the perimeter of a square, only one side need be known. Encourage the students to draw a picture to help solve the problem.

2. Play "Buzz" to reinforce counting skills. Each student, in turn, calls out a number, counting by ones. If you are playing the 2-game, then each time a student is in line to say a multiple of 2, he or she says, "Buzz!" instead. If you are playing the 5-game, the student in line to say a multiple of 5 must say, "Buzz!" instead. The counting should proceed quickly. When a student makes an error he or she is dropped from the remaining rounds of that game.

3. Have the students act out buying and selling situations in small groups. Give each group objects with price tags to sell and play money. Encourage the proper counting out of the change.

## Enrichment

1. Prepare activity cards for the Measurement Centre like:

How many different ways can you count the change for 64¢ from \$1.00?

Use the fewest coins possible to make change for \$3.55 from \$5.00.

2. Keep a collection of cash register tapes from grocery purchases for use at the Centre. Ask the students to write the following for each:

- the total amount spent,
- the amount of money given to the clerk,
- a counting out of the change given.

## Extra Practice

## Worksheet M10

Pages 86-87

Complete the sequences.

- 10, 15, 20, 25, 30, 35
- 20, 30, 40, 50, 60, 70
- \$1.25, \$1.50, \$1.75, \$2.00, \$2.25, \$2.50
- \$3.80, \$3.90, \$4.00, \$4.10, \$4.20, \$4.30

Express each amount in another way.

- $\$1.00 = 42¢ + 8 \text{ pennies} + 2 \text{ quarters}$
- $50¢ = 21¢ + 4 \text{ pennies} + 5 \text{ nickels}$
- $\$2.00 = \$1.58 + 2 \text{ pennies} + 4 \text{ dimes}$

Count the change.

- for 83¢ from \$2.00 2¢, nickel, dime, \$1
- for 69¢ from \$5.00 1¢, 5¢, 25¢, \$4
- for \$15.95 from \$20.00 5¢, \$4

Solve.

- Joan bought a purse for \$2.87. She gave the clerk \$5.00. Count out the change she should get. 3¢, 10¢, \$2

## UNIT 4 LESSON 10

### Objective M11

Recognize and use the millilitre as a unit of capacity.

### Introducing the Lesson

Discuss the everyday uses of capacity measurements. If possible, display items such as milk cartons, eye drop bottles, pop cans, nail polish bottles, cologne bottles, small oil cans, and so on. Show that the two units for capacity measurement used most frequently with these containers are the **litre** and the **millilitre**. Explain that the millilitre is for smaller capacities.

Allow the students to see and hold a container filled with one litre of fluid, e.g., a milk carton, and a container filled with one millilitre of fluid, e.g., a centicube or a thimble.

### Teaching the Lesson

Read and discuss the story on page 88. Using a graduated cylinder, have the students fill glasses with water to 50 mL, 100 mL, 150 mL, 200 mL and 250 mL as Sandy did. Be sure the class understands the markings on the graduated cylinder before measuring the amounts of water.

Have the students work in small groups to measure the capacities of several different-sized containers. Besides giving them facility in capacity measuring techniques, these activities will give them a base for *estimating* capacity.

Demonstrate the relationship between millilitres and litres with a decimetre cube, which holds 1 L of water, and a centimetre cube, which holds 1 mL of water. Show how 1000 centimetre cubes fit into one decimetre cube. Thus,  $1000 \text{ mL} = 1 \text{ L}$ . Write this equation on the chalkboard.

Show these two containers filled with water: **a.** a 1 L container, **b.** a 250 mL container. Ask, "How many millilitres is that in all?" Point out how the units must be the same before adding. Try other similar examples.

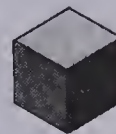
## Capacity

Sandy is making a "water xylophone". She has 5 glasses the same size. She wants to measure the amount of water to put in each glass.



The litre measure is too big.

A **millilitre** is very small. It is the amount of liquid you could put in a cube that measures 1 cm on each side.



The symbol for millilitre is **mL**.

A thimble holds about 1 mL.

A drinking glass holds about 250 mL.

$$1000 \text{ mL} = 1 \text{ L}$$

Sandy tried filling the glasses with 50 mL, 100 mL, 150 mL, 200 mL, and 250 mL.

### EXERCISES

Choose the more likely measurement.

- |  |  |
|--|--|
| 1. a bottle cap: 1 mL or 1 L <b>1 mL</b> | 2. a pop can: 25 mL or 250 mL <b>250 mL</b>  |
| 3. a soup spoon: 2 mL or 2 L <b>2 mL</b> | 4. a teapot: 500 mL or 5 L <b>500 mL</b>     |
| 5. a plastic cup: 15 mL or 150 mL        | 6. a milk carton: 1 L or 10 mL <b>1 L</b>    |
| 7. a small perfume bottle: <b>150 mL</b> | 8. a thermos bottle: 10 mL or 1 L <b>1 L</b> |
| 50 mL or 5 L <b>50 mL</b>                |  |

Estimate the capacity.

- |                                     |                                    |
|-------------------------------------|------------------------------------|
| 9. a small pill bottle <b>15 mL</b> | 10. a drinking glass <b>250 mL</b> |
| 11. a large jam jar <b>350 mL</b>   | 12. a kettle <b>1 L</b>            |
| 13. a fish bowl <b>2 L</b>          | 14. a pail <b>5 L</b>              |
| 15. a waste basket <b>4 L</b>       | 16. an aquarium <b>20 L</b>        |
| 17. a baby food jar <b>40 mL</b>    | 18. a large juice can <b>1 L</b>   |
| 19. a can of tomatoes <b>350 mL</b> | 20. a big paint can <b>5 L</b>     |
| 21. a spice container <b>50 mL</b>  | 22. an egg cup <b>30 mL</b>        |

Estimate examples:

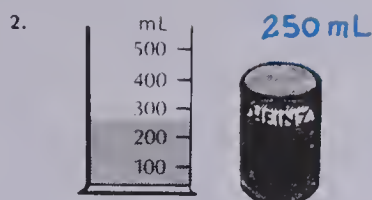
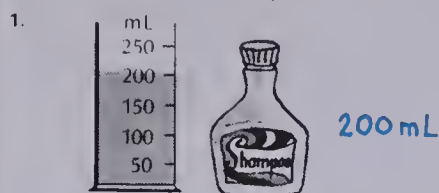
### Using the Exercises

- Questions 1 and 8 involve choosing the most appropriate measurement for a variety of containers.
- Questions 9 to 22 require that a capacity estimate be given for various containers.



## PRACTICE

Read the amount of liquid shown in the container.



Copy and complete the equations.

3.  $1 \text{ L} = \blacksquare \text{ mL}$  1000  
4.  $3 \text{ L} = \blacksquare \text{ mL}$  3000  
5.  $12 \text{ L} = \blacksquare \text{ mL}$  12 000

Solve.

6. A punch recipe calls for 1 L orange juice, 750 mL apple juice, and 824 mL ginger ale. What is the total amount of liquid called for in the recipe? 2574 mL

## REVIEW

Examples:

- M7 Name an everyday object that has a mass of about:  
1. 1 g raisin 2. 100 g egg 3. 300 g grapefruit

Write each amount using a dollar sign

- M8 4. 32¢ \$0.32 5. 8¢ \$0.08 6. 149¢ \$1.49

Write each amount using a cent sign

7. \$0.06 6¢ 8. \$0.70 70¢ 9. \$1.50 150¢

Add or subtract.

- M9 10.  $\begin{array}{r} \$6.05 \\ + 8.75 \\ \hline \$14.80 \end{array}$  11.  $\begin{array}{r} \$5.72 \\ + 1.84 \\ \hline \$7.56 \end{array}$  12.  $\begin{array}{r} \$8.94 \\ - 5.27 \\ \hline \$3.67 \end{array}$  13.  $\begin{array}{r} \$35.12 \\ - 11.86 \\ \hline \$23.26 \end{array}$

Count the change

- M10 14. for 37¢ from \$1.00 three 1¢, one dime, 2 quarters 15. for \$2.76 from \$5.00 four 1¢, two dimes, one \$2

Name a container that has a capacity of about: Examples:

- M11 16. 250 mL popcorn 17. 25 mL pill bottle 18. 500 mL small milk carton

89

## Assigning the Practice

Minimum: 1-6

Average: 1-6

Enriched: 1-6

## Review Exercises

Questions	Objective	Pages
1-3	M7	78-79
4-9	M8	80-81
10-13	M9	82-83
14-15	M10	86-87
16-18	M11	88-89

## Reinforcement

1. Set up the following activities for the Measurement Centre.

a. For a variety of empty containers, give an estimate and then actually measure the capacity of each.

b. Fill several different-sized jars with water. Ask the students to estimate and then measure the capacity of each.

2. Ask the students to keep track of the amount of liquid they drink in one day.

## Enrichment

1. Encourage the students to study the differences in the amount of water evaporated from equal-capacity containers offering differing surfaces. For example, put a litre of water in a flat pan, in a bowl, and in a narrow-necked jar.



Ask the students to measure each day the amount of water left in each container. A daily bar graph record for each container can also be kept.

2. Have the students research the monthly or yearly average precipitation for various Canadian cities. The findings can be made into a bulletin board display or can be graphed.

## Extra Practice

Estimate the capacity.

1. a thimble 1 mL 2. a large tube of tooth paste 250 mL  
3. a small peanut butter jar 250 mL 4. a large bucket 4 L  
5. a large ice cream box 1 L 6. a bottle of floor polish 500 mL

Do the following calculations.

7.  $59 \text{ mL} - 25 \text{ mL} = 34 \text{ mL}$  8.  $453 \text{ mL} + 513 \text{ mL} = 966 \text{ mL}$   
9.  $32 \text{ L} - 26 \text{ L} = 6 \text{ L}$  10.  $82 \text{ mL} + 6 \text{ L} = 6082 \text{ mL}$   
11.  $7 \text{ L} - 258 \text{ mL} = 6742 \text{ mL}$  12.  $2 \text{ L} + 5 \text{ L} + 350 \text{ mL} = 7350 \text{ mL}$

Solve.

13. Peter drank two 284 mL cartons of milk. How many millilitres did he drink? 568 mL  
14. Mrs. Weimer used 250 mL of milk while she was making a cake. How much milk is left, if she started with 1 L? 750 mL

## Worksheet M11

Pages 88-89

Unit 4 Objectives	Test Questions	Pages
M3, M5	1-3, 5	70-71, 74-75
M4	4	72-73
M6	7-8	76-77
M7	9-11	78-79
M8	12-17	80-81
M9	18-21	82-83
M10	22-23	86-87
M11	6, 24-26	88-89

# TEST

# UNIT 4

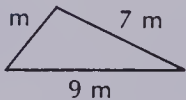

Use a ruler to measure the line segments.

1. 1 cm 2. 25 mm 3. 17 mm

What is the missing number?

4. 1000 m = 1 km 5. 10 mm = 1 cm 6. 1000 mL = 1 L

What is the perimeter of each figure?

7.  20 m 8.  12 km

Estimate the mass of each.

9. a dime 2 g or 2 kg 10. a fourth grader 3 kg or 30 kg 11. your math book 50 g or 500 g

Write each amount as a numeral with a dollar sign.

12. 7¢ \$0.07 13. 35¢ \$0.35 14. 57¢ \$0.57

Write each amount as a numeral with a cent sign.

15. \$0.32 32¢ 16. \$0.04 4¢ 17. \$0.80 80¢

Add or subtract.

18.  $\begin{array}{r} \$5.31 \\ + 0.46 \\ \hline \$5.77 \end{array}$  19.  $\begin{array}{r} \$7.46 \\ + 6.89 \\ \hline \$14.35 \end{array}$  20.  $\begin{array}{r} \$3.74 \\ - 1.27 \\ \hline \$1.47 \end{array}$  21.  $\begin{array}{r} \$8.37 \\ - 5.81 \\ \hline \$2.56 \end{array}$

What is the change:

22. for 49¢ from \$1.00 51¢ 23. for \$1.70 from \$2.00 \$0.30

Estimate the capacity of each.

24. a bottle cap: 5 mL or 50 mL 25. an ordinary glass: 50 mL or 200 mL  
26. a pail: 5 L or 50 L

## Post-test

## Unit 4

Measure the line segment in millimetres.

1.  122 mm

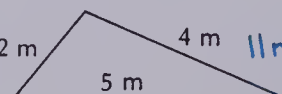

What unit of length would you use to measure:

2. the distance from Regina to Calgary km 3. the length of a garage? m

What is the missing number?

4. 2 km = 2000 m 5. 80 cm = 800 mm 6. 1 L = 1000 mL

What is the perimeter of each figure?

7.  11 m 8.  30 km

Estimate the mass of each.

9. an eraser 1 kg or 10 g 10. a football player 90 kg or 900 g 11. your shoes 600 g or 6 kg

## ADD / SUBTRACT

Add

- |   |  |  |   |  |
|---|--|--|---|--|
| 1. $\begin{array}{r} 3 \\ + 5 \\ \hline 8 \end{array}$          | 2. $\begin{array}{r} 24 \\ + 4 \\ \hline 28 \end{array}$         | 3. $\begin{array}{r} 53 \\ + 44 \\ \hline 97 \end{array}$            | 4. $\begin{array}{r} 430 \\ + 19 \\ \hline 449 \end{array}$       | 5. $\begin{array}{r} 503 \\ + 184 \\ \hline 687 \end{array}$         |
| 6. $\begin{array}{r} 9 \\ + 6 \\ \hline 15 \end{array}$         | 7. $\begin{array}{r} 47 \\ + 6 \\ \hline 53 \end{array}$         | 8. $\begin{array}{r} 25 \\ + 36 \\ \hline 61 \end{array}$            | 9. $\begin{array}{r} 854 \\ + 29 \\ \hline 883 \end{array}$       | 10. $\begin{array}{r} 626 \\ + 137 \\ \hline 763 \end{array}$        |
| 11. $\begin{array}{r} 70 \\ + 89 \\ \hline 159 \end{array}$     | 12. $\begin{array}{r} 64 \\ + 58 \\ \hline 122 \end{array}$      | 13. $\begin{array}{r} 714 \\ + 97 \\ \hline 811 \end{array}$         | 14. $\begin{array}{r} 507 \\ + 197 \\ \hline 704 \end{array}$     | 15. $\begin{array}{r} 618 \\ + 294 \\ \hline 912 \end{array}$        |
| 16. $\begin{array}{r} 1604 \\ + 163 \\ \hline 1767 \end{array}$ | 17. $\begin{array}{r} 8563 \\ + 218 \\ \hline 8781 \end{array}$  | 18. $\begin{array}{r} 5119 \\ + 3467 \\ \hline 8586 \end{array}$     | 19. $\begin{array}{r} 3669 \\ + 4054 \\ \hline 7723 \end{array}$  | 20. $\begin{array}{r} 2758 \\ + 2758 \\ \hline 5516 \end{array}$     |
| 21. $\begin{array}{r} 9 \\ 5 \\ + 6 \\ \hline 20 \end{array}$   | 22. $\begin{array}{r} 12 \\ 36 \\ + 43 \\ \hline 91 \end{array}$ | 23. $\begin{array}{r} 106 \\ 427 \\ + 319 \\ \hline 852 \end{array}$ | 24. $\begin{array}{r} 82 \\ 64 \\ + 33 \\ \hline 159 \end{array}$ | 25. $\begin{array}{r} 326 \\ 161 \\ + 472 \\ \hline 959 \end{array}$ |

Subtract.

- |   |   |   |  |  |
|---|---|---|--|--|
| 26. $\begin{array}{r} 9 \\ - 4 \\ \hline 5 \end{array}$         | 27. $\begin{array}{r} 34 \\ - 3 \\ \hline 31 \end{array}$       | 28. $\begin{array}{r} 75 \\ - 35 \\ \hline 40 \end{array}$      | 29. $\begin{array}{r} 46 \\ - 33 \\ \hline 13 \end{array}$       | 30. $\begin{array}{r} 891 \\ - 50 \\ \hline 841 \end{array}$     |
| 31. $\begin{array}{r} 789 \\ - 452 \\ \hline 337 \end{array}$   | 32. $\begin{array}{r} 645 \\ - 241 \\ \hline 404 \end{array}$   | 33. $\begin{array}{r} 17 \\ - 8 \\ \hline 9 \end{array}$        | 34. $\begin{array}{r} 72 \\ - 7 \\ \hline 65 \end{array}$        | 35. $\begin{array}{r} 55 \\ - 9 \\ \hline 46 \end{array}$        |
| 36. $\begin{array}{r} 82 \\ - 53 \\ \hline 29 \end{array}$      | 37. $\begin{array}{r} 142 \\ - 37 \\ \hline 105 \end{array}$    | 38. $\begin{array}{r} 910 \\ - 409 \\ \hline 501 \end{array}$   | 39. $\begin{array}{r} 567 \\ - 88 \\ \hline 479 \end{array}$     | 40. $\begin{array}{r} 625 \\ - 147 \\ \hline 478 \end{array}$    |
| 41. $\begin{array}{r} 8423 \\ - 257 \\ \hline 8166 \end{array}$ | 42. $\begin{array}{r} 3054 \\ - 698 \\ \hline 2356 \end{array}$ | 43. $\begin{array}{r} 5000 \\ - 821 \\ \hline 4179 \end{array}$ | 44. $\begin{array}{r} 5632 \\ - 3458 \\ \hline 2174 \end{array}$ | 45. $\begin{array}{r} 8100 \\ - 5413 \\ \hline 2687 \end{array}$ |

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Write each amount as a numeral with a dollar sign.

12. 4¢ = \$0.04      13. 62¢ = \$0.62      14. 98¢ = \$0.98

Write each amount as a numeral with a cent sign.

15. \$0.19 = 19¢      16. \$0.02 = 2¢      17. \$0.60 = 60¢

Add or subtract.

- |  |   |   |   |
|--|---|---|---|
| 18. $\begin{array}{r} \$5.31 \\ - 2.95 \\ \hline \$2.36 \end{array}$ | 19. $\begin{array}{r} \$6.47 \\ + 3.59 \\ \hline \$10.06 \end{array}$ | 20. $\begin{array}{r} \$28.50 \\ - 12.84 \\ \hline \$15.66 \end{array}$ | 21. $\begin{array}{r} \$16.25 \\ + 19.48 \\ \hline \$35.73 \end{array}$ |
|--|---|---|---|

What is the change?

22. for \$1.27 from \$2.00 \$0.73      23. for 28¢ from \$1.00 \$0.72

Estimate the capacity of each.

24. a can of paint: 5 L or 500 mL      25. a teapot: 500 mL or 5 L  
 26. a bottle of nail polish: 14 mL or 140 mL



# UNIT 5

## Multiplication Facts

Theme: Toy Factory

Lesson	Objective		Pages
Preview		Review repeated addition.	93
1	A18	Use arrays, repeated addition, and commutativity to develop multiplication facts.	94-95
2	A19	Use 2 and 3 as factors in multiplication.	96-97
3	A20	Use 4 and 5 as factors in multiplication.	98-99
4	A21	Use 0 and 1 as factors in multiplication.	100-101
5	A22	Use 0 to 5 as factors in multiplication.	102-103
6	A23	Use 6 and 7 as factors in multiplication.	104-105
7	A24	Use 8 and 9 as factors in multiplication.	106-107
8	A25	Use 10 as a factor in multiplication.	108-109
9	A26	Use 0 to 10 as factors in multiplication.	110-111
10	PS5	Solve simple multiplication problems.	112-113
Test		Multiplication Facts	114
Review		Measurement	115

# About This Unit

Upon completion of this unit, students should be able to:

1. recall the basic multiplication facts with 0, 1, 2, ..., 10 as a factor.
2. understand the commutativity of factors when multiplying.
3. solve word problems using basic multiplication facts.

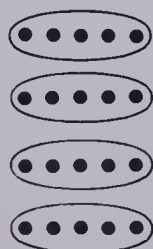
Since multiplication is an operation which determines the total number of members of several equivalent sets, it is linked to repeated addition in nearly every lesson. Peg board arrays are used to illustrate several equivalent sets. From these models the student is required to determine the corresponding repeated additions and multiplication facts.

To aid the student with fact memorization the concept of commutativity of factors is constantly stressed. Lesson 4, which deals with the properties of zero and one, also helps to minimize required multiplication.

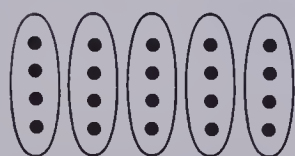
Throughout this chapter an effort has been made to relate multiplication to real life, problem-solving situations. Each lesson begins with such a situation. Then, after a discussion of the problem, concrete materials are used to stress the meaning of multiplication.

## Ideas

1. Arrays are frequently suggested for modeling a basic multiplication fact. For example, the following array can tell us two facts, depending on how the dots are grouped.



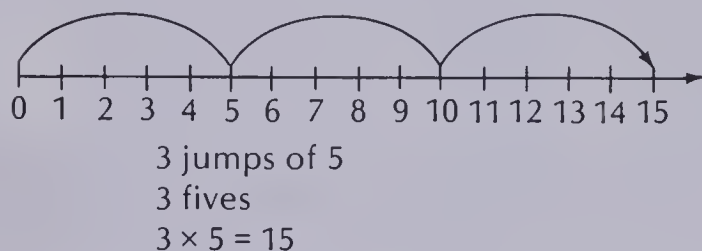
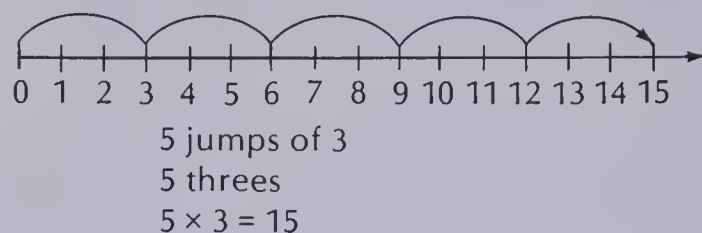
4 groups of 5  
4 fives  
 $4 \times 5 = 20$



5 groups of 4  
5 fours  
 $5 \times 4 = 20$

Examples like the above emphasize the commutative property of multiplication. At this time, the students need only name it as the *order* property.

2. A second way to model multiplication facts is to use jumps on a number line.



3. A review of skip counting is a good preparation for studying the basic multiplication facts. As the students name the multiples of a number, ask them also to note patterns that are formed on the 100 chart. For example, the pattern of the multiples of 4:

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Besides the 100 chart pattern, students should also note the patterns in the ones place of multiples, for example, of 5: 5, 10, 15, 20, etc. There is either a zero or 5 in the ones place.

In connection with skip counting, point out that these multiples are the *products* of a particular family of multiplication facts.

Multiples of 9:

Multiplication facts with 9:

9	=	$9 \times 1$
18	=	$9 \times 2$
27	=	$9 \times 3$
36	=	$9 \times 4$

# UNIT 5

## MULTIPLICATION



Unit 5 Objective	Test Questions	Pages
A18	1-7	94-95
A19	8-12	96-97
A20	13-17	98-99
A21	18-22	100-101
A22	23-27	102-103
A23	28-32	104-105
A24	33-37	106-107
A25	38-42	108-109

### Pretest

### Unit 5

Add or multiply.

1.  $5 + 5 + 5 = 15$     2.  $3 \times 5 = 15$     3.  $7 + 7 = 14$     4.  $2 \times 7 = 14$

Write two multiplication facts.

5.  $\begin{array}{cccc} \circ & \circ & \circ & \circ \\ \circ & \circ & \circ & \circ \\ \circ & \circ & \circ & \circ \\ \circ & \circ & \circ & \circ \\ \circ & \circ & \circ & \circ \end{array}$   $4 \times 5 = 20$   
 $5 \times 4 = 20$

6.  $\begin{array}{cccccccc} \circ & \circ & \circ & \circ & \circ & \circ & \circ & \circ \\ \circ & \circ & \circ & \circ & \circ & \circ & \circ & \circ \\ \circ & \circ & \circ & \circ & \circ & \circ & \circ & \circ \\ \circ & \circ & \circ & \circ & \circ & \circ & \circ & \circ \\ \circ & \circ & \circ & \circ & \circ & \circ & \circ & \circ \end{array}$   $8 \times 6 = 48$   
 $6 \times 8 = 48$

7.  $\begin{array}{cccccc} \circ & \circ & \circ & \circ & \circ & \circ \\ \circ & \circ & \circ & \circ & \circ & \circ \\ \circ & \circ & \circ & \circ & \circ & \circ \end{array}$   $6 \times 3 = 18$   
 $3 \times 6 = 18$

Multiply.

8.  $\begin{array}{r} 2 \\ \times 7 \\ \hline 14 \end{array}$

9.  $\begin{array}{r} 3 \\ \times 3 \\ \hline 9 \end{array}$

10.  $\begin{array}{r} 9 \\ \times 2 \\ \hline 18 \end{array}$

11.  $\begin{array}{r} 8 \\ \times 3 \\ \hline 24 \end{array}$

12.  $\begin{array}{r} 2 \\ \times 2 \\ \hline 4 \end{array}$

13.  $\begin{array}{r} 4 \\ \times 5 \\ \hline 20 \end{array}$

14.  $\begin{array}{r} 5 \\ \times 6 \\ \hline 30 \end{array}$

15.  $\begin{array}{r} 4 \\ \times 4 \\ \hline 16 \end{array}$

16.  $\begin{array}{r} 5 \\ \times 9 \\ \hline 45 \end{array}$

17.  $\begin{array}{r} 8 \\ \times 4 \\ \hline 32 \end{array}$



# Toy Factory

Copy and complete the total for each toy.

## Inventory

Item	Total
1. teddy bears: 4 boxes of 2	$2+2+2+2=8$
2. rubber snakes: 2 boxes of 6	$6+6=12$
3. skipping ropes: 3 bundles of 10	$10+10+10=30$
4. fire trucks: 5 boxes of 3	$3+3+3+3+3=15$
5. bingo games: 4 boxes of 4	$4+4+4+4=16$
6. walking dolls: 3 boxes of 2	$2+2+2=6$
7. play dough: 1 box of 6	6
8. model tanks: 3 boxes of 4	$4+4+4=12$
9. electric trains: 2 boxes of 2	$2+2=4$
10. toy robots: 9 boxes of 2	$2+2+2+2+2+2+2+2+2=18$
11. toy drums: 4 boxes of 3	$3+3+3+3=12$
12. stuffed giraffe: 0 bags of 1	0
13. toy stoves: 5 boxes of 2	$2+2+2+2+2=10$
14. hula hoops: 7 bundles of 3	$3+3+3+3+3+3+3=21$
15. rocking horses: 6 boxes of 1	$1+1+1+1+1+1=6$
16. checkers: 3 boxes of 6	$6+6+6=18$
GRAND TOTAL 194	

# UNIT 5 PREVIEW

## Suggestions

Have the students imagine that they are working in a toy factory. Discuss the kinds of toys they could be making and what their job in the factory would be.

Discuss the term *inventory* as you point out page 93. Explain how useful it is for a factory owner to take an inventory of goods.

## About the Page

Display several items from your desk drawer. Have the students take an inventory of these items, using repeated addition to find the total amounts. Record their inventory on the chalkboard.

- 3 boxes of 6 pencils,  $6+6+6=18$
- 2 boxes of 8 crayons,  $8+8=16$
- 4 envelopes of 10 stickers,  $10+10+10+10=40$

Explain that the students must do a similar inventory of the toy factory on page 93. Discuss the first two examples which are already done. Point out that the Grand Total of items is 194. This amount can be used by the students as a check for their work.

## Reinforcement

Plan a used toy exchange among your students. Ask them to bring their toys to school, display and inventory them, and then exchange them with their classmates.

18. $\begin{array}{r} 0 \\ \times 5 \\ \hline 0 \end{array}$	19. $\begin{array}{r} 1 \\ \times 9 \\ \hline 9 \end{array}$	20. $\begin{array}{r} 8 \\ \times 1 \\ \hline 8 \end{array}$	21. $\begin{array}{r} 0 \\ \times 6 \\ \hline 0 \end{array}$	22. $\begin{array}{r} 7 \\ \times 0 \\ \hline 0 \end{array}$
23. $\begin{array}{r} 7 \\ \times 4 \\ \hline 28 \end{array}$	24. $\begin{array}{r} 3 \\ \times 9 \\ \hline 27 \end{array}$	25. $\begin{array}{r} 2 \\ \times 6 \\ \hline 12 \end{array}$	26. $\begin{array}{r} 5 \\ \times 8 \\ \hline 40 \end{array}$	27. $\begin{array}{r} 5 \\ \times 5 \\ \hline 25 \end{array}$
28. $\begin{array}{r} 8 \\ \times 6 \\ \hline 48 \end{array}$	29. $\begin{array}{r} 7 \\ \times 7 \\ \hline 49 \end{array}$	30. $\begin{array}{r} 6 \\ \times 4 \\ \hline 24 \end{array}$	31. $\begin{array}{r} 8 \\ \times 7 \\ \hline 56 \end{array}$	32. $\begin{array}{r} 6 \\ \times 6 \\ \hline 36 \end{array}$
33. $\begin{array}{r} 9 \\ \times 3 \\ \hline 27 \end{array}$	34. $\begin{array}{r} 8 \\ \times 5 \\ \hline 40 \end{array}$	35. $\begin{array}{r} 7 \\ \times 9 \\ \hline 63 \end{array}$	36. $\begin{array}{r} 8 \\ \times 6 \\ \hline 48 \end{array}$	37. $\begin{array}{r} 8 \\ \times 8 \\ \hline 64 \end{array}$
38. $\begin{array}{r} 5 \\ \times 10 \\ \hline 50 \end{array}$	39. $\begin{array}{r} 6 \\ \times 10 \\ \hline 60 \end{array}$	40. $\begin{array}{r} 10 \\ \times 9 \\ \hline 90 \end{array}$	41. $\begin{array}{r} 10 \\ \times 3 \\ \hline 30 \end{array}$	42. $\begin{array}{r} 10 \\ \times 10 \\ \hline 100 \end{array}$

# UNIT 5 LESSON 1

## Objective A18

Use arrays, repeated addition, and commutativity to develop multiplication facts.

## Introducing the Lesson

Write this repeated addition on the chalkboard. Through discussion of each, generate a second way of writing it.

$$2 + 2 + 2 + 2 + 2$$

"How many 2s?"

Five twos.

"Five twos can be written  $5 \times 2$ ."

## Teaching the Lesson

Draw the array at the top of page 94 on an overhead transparency.



Explain how the array can be looked at in terms of rows, "There are 3 rows of 5," or in terms of columns, "There are 5 columns of 3." Use different strategies for finding the total number of dots.

a. add the rows,  $5 + 5 + 5 = 15$

b. add the columns,  $3 + 3 + 3 + 3 + 3 = 15$

Recall that  $5 + 5 + 5$  is the same as 3 fives. The total amount can be found by counting by fives 3 times (5, 10, 15) or simply by multiplying,  $3 \times 5 = 15$ . Show, too, how  $3 + 3 + 3 + 3 + 3$  is the same as 5 threes. The total amount can be found by counting by threes 5 times (3, 6, 9, 12, 15) or by multiplying  $5 \times 3 = 15$ .

Observe how either strategy generates the same number of dots.

$$5 + 5 + 5 = 3 + 3 + 3 + 3 + 3$$

$$3 \text{ fives} = 5 \text{ threes}$$

$$3 \times 5 = 5 \times 3$$

Point out the meaning of the terms, **factor** and **product**.

Ask the students to draw an array for these facts.

$$4 \times 2$$

$$6 \times 3$$

## Multiplication

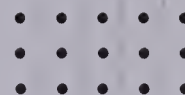
These arrays both contain 15 dots.



$$5 + 5 + 5 = 15$$

$$3 \text{ fives} = 15$$

$$3 \times 5 = 15$$



$$3 + 3 + 3 + 3 + 3 = 15$$

$$5 \text{ threes} = 15$$

$$5 \times 3 = 15$$

$3 \times 5$  is read "three times five".

3 and 5 are **factors**.

15 is the **product**.

$$3 \times 5 = 15$$

factor factor product

## EXERCISES

Add or multiply.

1.  $4 + 4$  8

2.  $2 \times 4$  8

3.  $2 + 2 + 2 + 2$  8

4.  $4 \times 2$  8

5.  $3 + 3 + 3 + 3$  12

6.  $4 \times 3$  12

7.  $4 + 4 + 4$  12

8.  $3 \times 4$  12

9.  $2 + 2$  4

10.  $2 \times 2$  4

11.  $3 + 3$  6

12.  $2 \times 3$  6

13.  $2 + 2 + 2$  6

14.  $3 \times 2$  6

Write the related multiplication fact.

15.  $3 + 3 = 6$

$2 \times 3 = 6$

16.  $4 + 4 + 4 = 12$

$3 \times 4 = 12$

17.  $5 + 5 = 10$

$2 \times 5 = 10$

18.  $3 + 3 + 3 = 9$

$3 \times 3 = 9$

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## Using the Exercises

- Questions 1 to 18 point out the relationship of repeated addition to multiplication. For questions 13 to 18 some verbal cues may be needed to help them write the related multiplication fact.
- The practice exercises are arranged to aid diagnosis and remediation. Students who are having difficulty at a particular stage should be given assistance by providing them with concrete materials to illustrate the meaning of the operation (such as plastic counters, bottle caps, toothpicks).
- Using a diagram or acting out the situation will help the pupils set up the word problems. At this stage, do not insist that the problems be solved by multiplication; accept counting or repeated addition as means to the solutions. This allows for individual differences.

## PRACTICE

Add or multiply.



1.  $2 + 2 + 2 = 6$

2.  $3 \times 2 = 6$



3.  $3 + 3 = 6$

4.  $2 \times 3 = 6$



5.  $5 + 5 = 10$

6.  $2 \times 5 = 10$



7.  $2 + 2 + 2 + 2 + 2 = 10$

8.  $5 \times 2 = 10$



9.  $4 + 4 + 4 = 12$

10.  $3 \times 4 = 12$

11.  $3 + 3 + 3 + 3 = 12$

12.  $4 \times 3 = 12$

Draw an array.

13.  $6 \times 2 = 12$

14.  $5 \times 3 = 15$

15.  $4 \times 1 = 4$

Write the related multiplication fact.

16.  $9 + 9 + 9 = 27$

17.  $7 + 7 + 7 + 7 = 28$

18.  $5 + 5 + 5 + 5 + 5 = 25$

$3 \times 9 = 27$

$4 \times 7 = 28$

$5 \times 5 = 25$

Write the related addition equation.

19.  $4 \times 8 = 32$

20.  $2 \times 7 = 14$

21.  $3 \times 6 = 18$

$8 + 8 + 8 + 8 = 32$

$7 + 7 = 14$

$6 + 6 + 6 = 18$

Solve.

22. A box of crayons has 8 crayons in it. Art Stores packs 6 boxes in a carton. Draw an array of dots to show this.

$48$



23. Each Robin Hood set has 4 arrows. Toycraft has arrows for 5 sets. Write a multiplication sentence about the number of arrows.

$4 \times 5 = 20$

## A Timely Challenge

See how many addition and multiplication equations you can write in 3 minutes.

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## Assigning the Practice

Minimum: 1-18

Average: 13-23

Enriched: 13-23

## Reinforcement

1. Assign *A Timely Challenge* at the bottom of page 95. Accuracy should be stressed. This activity can be repeated several times throughout this unit. Students can watch their own progress.

2. Make a "Concentration" game. Use 20 blank playing cards. Label 10 cards with various multiplication facts, e.g.,  $3 \times 7$ ,  $4 \times 3$ ,  $6 \times 2$ . Label the other 10 cards with corresponding addition facts, e.g.,  $7 + 7 + 7$ ,  $3 + 3 + 3 + 3$ ,  $2 + 2 + 2 + 2 + 2$ . Shuffle the cards together. Place all the cards face down between two players. Player A turns over any two cards. If a match is made, the player keeps the pair and takes another turn. If no match is made, cards are turned over and player B has a turn. Play continues until all cards are matched. The player with the most pairs is the winner.

## Enrichment

Ask the students to make several arrays and then to write two multiplication facts and two repeated additions for each.

## Extra Practice

Add or multiply.



1.  $5 + 5 + 5 + 5 = 20$

2.  $4 \times 5 = 20$

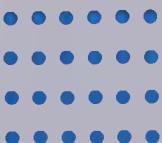


3.  $4 + 4 + 4 + 4 + 4 = 20$

4.  $5 \times 4 = 20$

Draw an array.

5.  $4 \times 6$



6.  $7 \times 3$



Write the related multiplication fact.

7.  $0 + 0 + 0 + 0 = 0$   $4 \times 0 = 0$

8.  $7 + 7 + 7 + 7 + 7 = 35$   $7 \times 5 = 35$

Write the related addition sentence.

9.  $3 \times 7 = 21$

10.  $9 \times 5 = 45$

11.  $7 \times 8 = 56$

$7 + 7 + 7 = 21$

$9 + 9 + 9 + 9 = 45$

$8 + 8 + 8 + 8 + 8 = 56$

## Worksheet A18

Pages 94-95



# UNIT 5 LESSON 2

## Objective A19

Use 2 and 3 as factors in multiplication.

### Introducing the Lesson

Review counting by twos and threes. Ask the students to count using a number line and/or a 100 chart to look for patterns. Vary students' counting so that it doesn't always begin at two or three.

- Count by twos from 15 to 30.
- Count by threes from 12 to 36.
- Count by twos from 14 to 40.
- Count by threes from 9 to 27.

### Teaching the Lesson

Discuss the meaning of a *pair* as you point out the illustrations at the top of page 96. Model the ice skate problem on a felt board with felt cutouts. Develop the meaning of  $5 \times 2 = 10$ .

"Five pairs is equal to five twos."

$$2 + 2 + 2 + 2 + 2 = 5 \times 2$$

Extend the lesson question by asking how many skates there would be with four pairs, seven pairs, nine pairs, six pairs, etc. Ask a student to write a repeated addition and a related multiplication for each.

Model the tennis ball problem on a felt board, also. Develop the meaning of  $4 \times 3 = 12$ .

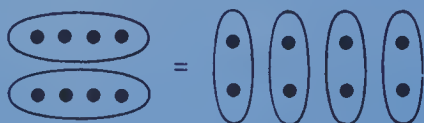
"Four cans with three balls in each can is equal to 4 threes."

$$3 + 3 + 3 + 3 = 4 \times 3$$

Ask also how many tennis balls there would be with seven cans, eight cans, five cans, etc. Again ask a student to write a repeated addition and a related multiplication for each.

Using another set of felt cutouts, demonstrate the commutativity of multiplication.

For example:  $2 \times 4 = 4 \times 2$



## 2 and 3 as Factors

How many skates are there in 5 pairs?

$$\begin{aligned} 2 + 2 + 2 + 2 + 2 &= 10 \\ 5 \text{ twos} &= 10 \\ 5 \times 2 &= 10 \end{aligned}$$

$$\begin{array}{r} 2 \\ \times 5 \\ \hline 10 \end{array}$$



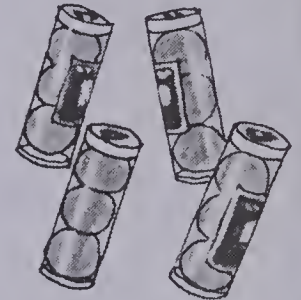
There are 10 skates in 5 pairs.

Tennis balls come in packages of 3.

How many balls are there in 4 packages?

$$\begin{aligned} 3 + 3 + 3 + 3 &= 12 \\ 4 \text{ threes} &= 12 \\ 4 \times 3 &= 12 \end{aligned}$$

$$\begin{array}{r} 3 \\ \times 4 \\ \hline 12 \end{array}$$



There are 12 tennis balls in 4 packages.

### EXERCISES

Add or multiply.

- $2 + 2 = 4$
- $2 \times 2 = 4$
- $2 + 2 + 2 = 6$
- $3 \times 2 = 6$
- $2 + 2 + 2 + 2 = 8$
- $4 \times 2 = 8$
- $3 + 3 = 6$
- $2 \times 3 = 6$
- $3 + 3 + 3 = 9$
- $3 \times 3 = 9$
- $3 + 3 + 3 + 3 = 12$
- $4 \times 3 = 12$

Multiply.

- |   |   |   |   |   |
|---|---|---|---|---|
| 13. $\begin{array}{r} 2 \\ \times 5 \\ \hline 10 \end{array}$ | 14. $\begin{array}{r} 2 \\ \times 6 \\ \hline 12 \end{array}$ | 15. $\begin{array}{r} 2 \\ \times 7 \\ \hline 14 \end{array}$ | 16. $\begin{array}{r} 2 \\ \times 8 \\ \hline 16 \end{array}$ | 17. $\begin{array}{r} 2 \\ \times 9 \\ \hline 18 \end{array}$ |
| 18. $\begin{array}{r} 3 \\ \times 5 \\ \hline 15 \end{array}$ | 19. $\begin{array}{r} 3 \\ \times 6 \\ \hline 18 \end{array}$ | 20. $\begin{array}{r} 3 \\ \times 7 \\ \hline 21 \end{array}$ | 21. $\begin{array}{r} 3 \\ \times 8 \\ \hline 24 \end{array}$ | 22. $\begin{array}{r} 3 \\ \times 9 \\ \hline 27 \end{array}$ |

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### Using the Exercises

- Questions 1 to 12 are paired so that the repeated addition precedes its related multiplication.
- Questions 13 to 17 include multiplications having 2 as a factor, while questions 18 to 22 include multiplications having 3 as a factor. Encourage the students to draw arrays and/or count by twos or threes to help solve the problem.

## PRACTICE

Multiply.

1.  $\begin{array}{r} 2 \\ \times 3 \\ \hline 6 \end{array}$
2.  $\begin{array}{r} 2 \\ \times 6 \\ \hline 12 \end{array}$
3.  $\begin{array}{r} 2 \\ \times 4 \\ \hline 8 \end{array}$
4.  $\begin{array}{r} 3 \\ \times 5 \\ \hline 15 \end{array}$
5.  $\begin{array}{r} 3 \\ \times 6 \\ \hline 18 \end{array}$
6.  $\begin{array}{r} 3 \\ \times 7 \\ \hline 21 \end{array}$
7.  $\begin{array}{r} 7 \\ \times 3 \\ \hline 21 \end{array}$
8.  $\begin{array}{r} 8 \\ \times 2 \\ \hline 16 \end{array}$
9.  $\begin{array}{r} 5 \\ \times 2 \\ \hline 10 \end{array}$
10.  $\begin{array}{r} 3 \\ \times 8 \\ \hline 24 \end{array}$
11.  $\begin{array}{r} 8 \\ \times 3 \\ \hline 24 \end{array}$
12.  $\begin{array}{r} 2 \\ \times 9 \\ \hline 18 \end{array}$
13.  $\begin{array}{r} 3 \\ \times 9 \\ \hline 27 \end{array}$
14.  $\begin{array}{r} 6 \\ \times 3 \\ \hline 18 \end{array}$
15.  $\begin{array}{r} 7 \\ \times 2 \\ \hline 14 \end{array}$

16. Count by twos to twenty.

2, 4, 6, 8, 10, 12, 14, 16, 18, 20

17. Count by threes to thirty.

3, 6, 9, 12, 15, 18, 21, 24, 27, 30

18. Copy and complete the table.

	1	2	3	4	5	6	7	8	9
$\times 2$	2	4	6	8	10	12	14	16	18
$\times 3$	3	6	9	12	15	18	21	24	27

Solve.

19. Tricky Toys packs 6 rubber snakes in a box. How many snakes are there in 3 boxes? **18**

20. Tricky Toys packs 6 rubber snakes and 2 rubber ducks in each box.

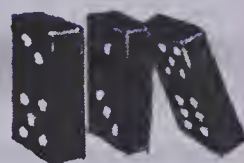
How many **snakes** are there in 3 boxes? **18**

## Lots of Dots

Toycraft packs dominoes in boxes that have 2 layers. Each layer has 2 rows of 7 dominoes.

How many dominoes are in a box? **28**

In 3 boxes? **84**



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## Assigning the Practice

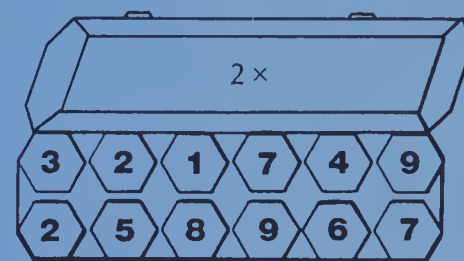
Minimum: 1-10, 16-19

Average: 6-20

Enriched: 6-20

## Reinforcement

1. Mark one egg carton,  $\times 2$ , and another,  $\times 3$ . In each section write the numbers 1 to 9. Some numbers can be repeated. Place a bean in the cartons and ask two students to close the lid and shake. Then they open the carton to see where the bean has landed, multiply that number by 2 (or 3), and pass the carton to someone else.



2. Ask the students to count by twos to 20 and then by threes to 30. Have them use their counting as they write a multiplication table for 2 and for 3.

3. Make skip-counting packets. Place in an envelope ten cutouts labelled 2, 4, 6, ..., 20. Have the students put them in order. Do the same with the threes.

4. Give the students a short written quiz every day. Have them record their marks in graph form (bar graph or line graph). Graphs are not taken until Unit 13, but if the teacher sets up the graph for each student, then the students should be able to continue it and see their progress.

## Enrichment

1. Assign *Lots of Dots* at the bottom of page 97. Students can model the problem as an aid for solving it. Interested students may wish to chart the information and extend the question beyond one and three boxes.

2. Have the students complete these patterns.

- a. 6, 8, 10, ■, ■, ■.
- b. 15, 18, 21, ■, ■, ■.
- c. 3, 5, 7, ■, ■, ■.
- d. 14, 17, 20, ■, ■, ■.
- e. 32, 34, 36, ■, ■, ■.
- f. 300, 600, 900, ■, ■, ■.

## Extra Practice

Multiply.

1.  $\begin{array}{r} 5 \\ \times 2 \\ \hline 10 \end{array}$
2.  $\begin{array}{r} 2 \\ \times 7 \\ \hline 14 \end{array}$
3.  $\begin{array}{r} 4 \\ \times 2 \\ \hline 8 \end{array}$
4.  $\begin{array}{r} 9 \\ \times 2 \\ \hline 18 \end{array}$
5.  $\begin{array}{r} 2 \\ \times 8 \\ \hline 16 \end{array}$
6.  $\begin{array}{r} 3 \\ \times 2 \\ \hline 6 \end{array}$
7.  $\begin{array}{r} 3 \\ \times 7 \\ \hline 21 \end{array}$
8.  $\begin{array}{r} 8 \\ \times 3 \\ \hline 24 \end{array}$
9.  $\begin{array}{r} 3 \\ \times 5 \\ \hline 15 \end{array}$
10.  $\begin{array}{r} 4 \\ \times 3 \\ \hline 12 \end{array}$
11.  $\begin{array}{r} 6 \\ \times 2 \\ \hline 12 \end{array}$
12.  $\begin{array}{r} 3 \\ \times 3 \\ \hline 9 \end{array}$
13.  $\begin{array}{r} 2 \\ \times 1 \\ \hline 2 \end{array}$
14.  $\begin{array}{r} 7 \\ \times 3 \\ \hline 21 \end{array}$
15.  $\begin{array}{r} 3 \\ \times 9 \\ \hline 27 \end{array}$

Solve.

16. A school ordered 6 bags of clay. Each bag contains 3 kg of clay. How much clay did the school order?

**18 kg**

## Worksheet A19

Pages 96-97

# UNIT 5 LESSON 3

## Objective A20

Use 4 and 5 as factors in multiplication.

### Introducing the Lesson

Review counting by fours and fives.  
Record as the students count on the chalkboard.

Note the patterns.

1. 4, 8, 12, 16, etc. Each number is even.
2. 5, 10, 15, 20, etc. Each number ends in zero or five.

### Teaching the Lesson

Read and discuss the teddy bear problem at the top of page 98. Model the situation on an overhead projector using centicubes for teddy bears.

Four groups of six is the same as 4 sixes.  
 $6 + 6 + 6 + 6 = 4 \times 6$

Suppose the teddy bears were packed in boxes of 4 and there were 6 boxes. Have a student model this situation on the projector. Compare this to the first situation modelled. Discuss how a change in the order of the factors does not change the product.

$$4 \times 6 = 24$$



$$6 \times 4 = 24$$



Generate the other multiplication facts of 4 in a similar way.

Read and discuss the cuddly cat problem on page 98.

Model it, also, with centicubes on the overhead projector. Develop the meaning of "all of the multiplication facts with 5 as a factor".

## 4 and 5 as Factors

The Fluffy Toy company packs teddy bears in boxes of 6.

How many teddy bears will there be in 4 boxes?

$$6 + 6 + 6 + 6 = 24$$

$$4 \times 6 = 24$$

In 4 boxes there will be 24 teddy bears.

$$\begin{array}{r} 6 \\ \times 4 \\ \hline 24 \end{array}$$



Cuddly cats are smaller than teddy bears.

They are packed in boxes of 8.

How many cats will there be in 5 boxes?

$$8 + 8 + 8 + 8 + 8 = 40$$

$$5 \times 8 = 40$$

In 5 boxes there will be 40 cats.

$$\begin{array}{r} 8 \\ \times 5 \\ \hline 40 \end{array}$$



### EXERCISES

Add or multiply.

- |                              |                            |                                   |                            |
|------------------------------|----------------------------|-----------------------------------|----------------------------|
| 1. $4 + 4$ <b>8</b>          | 2. $2 \times 4$ <b>8</b>   | 3. $4 + 4 + 4$ <b>12</b>          | 4. $3 \times 4$ <b>12</b>  |
| 5. $4 + 4 + 4 + 4$ <b>16</b> | 6. $4 \times 4$ <b>16</b>  | 7. $5 + 5$ <b>10</b>              | 8. $2 \times 5$ <b>10</b>  |
| 9. $5 + 5 + 5$ <b>15</b>     | 10. $3 \times 5$ <b>15</b> | 11. $5 + 5 + 5 + 5 + 5$ <b>25</b> | 12. $4 \times 5$ <b>20</b> |

Multiply.

- |   |   |   |   |   |
|---|---|---|---|---|
| 13. $\begin{array}{r} 4 \\ \times 5 \\ \hline 20 \end{array}$ | 14. $\begin{array}{r} 4 \\ \times 6 \\ \hline 24 \end{array}$ | 15. $\begin{array}{r} 4 \\ \times 7 \\ \hline 28 \end{array}$ | 16. $\begin{array}{r} 4 \\ \times 8 \\ \hline 32 \end{array}$ | 17. $\begin{array}{r} 4 \\ \times 9 \\ \hline 36 \end{array}$ |
| 18. $\begin{array}{r} 5 \\ \times 5 \\ \hline 25 \end{array}$ | 19. $\begin{array}{r} 5 \\ \times 6 \\ \hline 30 \end{array}$ | 20. $\begin{array}{r} 5 \\ \times 7 \\ \hline 35 \end{array}$ | 21. $\begin{array}{r} 5 \\ \times 8 \\ \hline 40 \end{array}$ | 22. $\begin{array}{r} 5 \\ \times 9 \\ \hline 45 \end{array}$ |

### Using the Exercises

- Questions 1 to 12 are paired so that the repeated addition precedes its related multiplication.
- Questions 13 to 17 include multiplications having 4 as a factor, while questions 18 to 22 include multiplications having 5 as a factor.



## PRACTICE

Multiply.

1.  $\begin{array}{r} 4 \\ \times 3 \\ \hline 12 \end{array}$
  2.  $\begin{array}{r} 4 \\ \times 6 \\ \hline 24 \end{array}$
  3.  $\begin{array}{r} 5 \\ \times 4 \\ \hline 20 \end{array}$
  4.  $\begin{array}{r} 5 \\ \times 5 \\ \hline 25 \end{array}$
  5.  $\begin{array}{r} 4 \\ \times 4 \\ \hline 16 \end{array}$
  6.  $\begin{array}{r} 4 \\ \times 8 \\ \hline 32 \end{array}$
  7.  $\begin{array}{r} 8 \\ \times 4 \\ \hline 32 \end{array}$
  8.  $\begin{array}{r} 5 \\ \times 7 \\ \hline 35 \end{array}$
  9.  $\begin{array}{r} 7 \\ \times 5 \\ \hline 35 \end{array}$
  10.  $\begin{array}{r} 5 \\ \times 6 \\ \hline 30 \end{array}$
  11.  $\begin{array}{r} 4 \\ \times 7 \\ \hline 28 \end{array}$
  12.  $\begin{array}{r} 9 \\ \times 4 \\ \hline 36 \end{array}$
  13.  $\begin{array}{r} 5 \\ \times 9 \\ \hline 45 \end{array}$
  14.  $\begin{array}{r} 5 \\ \times 8 \\ \hline 40 \end{array}$
  15.  $\begin{array}{r} 4 \\ \times 6 \\ \hline 24 \end{array}$
16. 4 puzzles in a bag  
8 bags  
How many puzzles in all? **32**
17. 5 players on a team  
2 teams  
How many players in all? **10**

18. Copy and complete this chart.

	1	2	3	4	5	6	7	8	9
$\times 4$	4	8	<b>12</b>	<b>16</b>	<b>20</b>	<b>24</b>	<b>28</b>	<b>32</b>	<b>36</b>
$\times 5$	5	10	<b>15</b>	<b>20</b>	<b>25</b>	<b>30</b>	<b>35</b>	<b>40</b>	<b>45</b>

Solve.

19. The Fluffy Toy Company sold 6 of their \$5 stuffed toys to a toy store. How much should they charge the toy store? **\$30**
20. There are 8 paper party hats in every bag of hats. How many hats are there in 4 bags? **32**

## Bear With Us

Fluffy Toys makes 3 different sizes of teddy bears.

Each size is available in 2 colours.

How many different teddy bears does the company make? **6**

99

## Assigning the Practice

Minimum: 1-18

Average: 1-20

Enriched: 1-20

## Reinforcement

1. Assign *Bear With Us* at the bottom of page 99.

2. Prepare two sets of cards: one set gives a product on each card, the other set gives a multiplication with 4 or 5 on each card. Have the students play a matching game with the cards.

3. Ask the students to complete these.

Rule: $\times 4$	
in	out
7	
9	
6	
5	
2	
4	
8	
3	

Rule: $\times 5$	
in	out
5	
2	
8	
6	
4	
1	
9	
7	

4. Have the students make a number line from 0 to 40 and mark hops with an arrow as they count by fours. Do the same for counting by fives.

## Enrichment

1. Have the students investigate the products of three factors with these examples.

- a.  $3 \times 2 \times 3$
- b.  $4 \times 2 \times 5$
- c.  $6 \times 3 \times 4$
- d.  $2 \times 2 \times 7$
- e.  $4 \times 3 \times 2$

2. Ask the students to complete the counting and describe the patterns.

- a. Count by 4s to 40.
- b. Count by 40s to 400.
- c. Count by 400s to 4000.
- d. Count by 5s to 50.
- e. Count by 50s to 500.
- f. Count by 500s to 5000.

## Extra Practice

Multiply.

1.  $\begin{array}{r} 4 \\ \times 7 \\ \hline 28 \end{array}$
2.  $\begin{array}{r} 3 \\ \times 4 \\ \hline 12 \end{array}$
3.  $\begin{array}{r} 9 \\ \times 4 \\ \hline 36 \end{array}$
4.  $\begin{array}{r} 4 \\ \times 8 \\ \hline 32 \end{array}$
5.  $\begin{array}{r} 6 \\ \times 4 \\ \hline 24 \end{array}$
6.  $\begin{array}{r} 5 \\ \times 5 \\ \hline 25 \end{array}$
7.  $\begin{array}{r} 7 \\ \times 5 \\ \hline 35 \end{array}$
8.  $\begin{array}{r} 5 \\ \times 3 \\ \hline 15 \end{array}$
9.  $\begin{array}{r} 9 \\ \times 5 \\ \hline 45 \end{array}$
10.  $\begin{array}{r} 5 \\ \times 8 \\ \hline 40 \end{array}$
11.  $\begin{array}{r} 5 \\ \times 4 \\ \hline 20 \end{array}$
12.  $\begin{array}{r} 2 \\ \times 5 \\ \hline 10 \end{array}$
13.  $\begin{array}{r} 4 \\ \times 4 \\ \hline 16 \end{array}$
14.  $\begin{array}{r} 6 \\ \times 5 \\ \hline 30 \end{array}$
15.  $\begin{array}{r} 7 \\ \times 4 \\ \hline 28 \end{array}$

Solve.

16. A quarter can be exchanged for 5 nickels. How many nickels will you get for 7 quarters? **35**

## Worksheet A20

Pages 98-99

# UNIT 5 LESSON 4

## Objective A21

Use 0 and 1 as factors in multiplication.

### Introducing the Lesson

Review what happens when zero is added to or subtracted from another number with these examples.

$$4 + 0 \quad 9 - 0 \quad 45 + 0 \quad 67 - 0$$

Ask the students to think of **names for zero**, such as:  $7 - 7$ ,  $392 - 392$ , or  $0 + 0$ .

Ask the students to think of names for one, such as:  $8 - 7$ ,  $1 + 0$ , or  $94 - 93$ .

### Teaching the Lesson

Read, discuss, and model the two problems at the top of page 100.

Extend the concept of multiplying by one with several other problems for the students to model and find products.

Nine ones.  $1+1+1+1+1+1+1+1+1$   
 $9 \times 1$

One nine.  $1 \times 9$

Gradually, students will grasp the concept that **any number multiplied by one is the number itself**.

$$\begin{array}{ll} 42 \times 1 = 42 & 1 \times 975 = 975 \\ 823 \times 1 = 823 & 1 \times 78 = 78 \end{array}$$

Present the notion of multiplying by zero with several other examples until the students understand that **any number multiplied by zero is zero**.

$$\begin{array}{ll} 19 \times 0 = 0 & 0 \times 245 = 0 \\ 263 \times 0 = 0 & 0 \times 38 = 0 \end{array}$$

Have the students say the number that is named by the following.

$$\begin{array}{ll} 5 \times 1 & 5 - 5 \\ 5 - 0 & 5 + 0 \\ 5 \times 0 & 1 \times 5 \\ 0 \times 0 & 1 \times 0 \end{array}$$

## 1 and 0 as Factors

In December, classes come to visit the Toycraft factory.  
 Only 1 class may come each day.  
 In 5 days, how many classes may visit the factory?

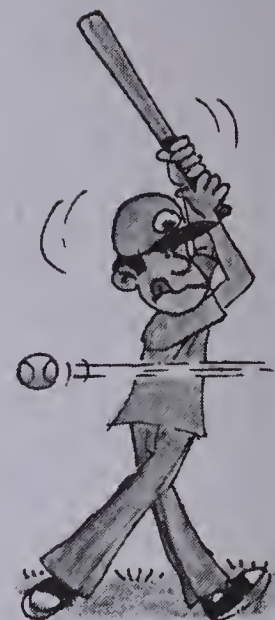
$$\begin{array}{r} 1 + 1 + 1 + 1 + 1 = 5 \\ 5 \times 1 = 5 \end{array} \quad \begin{array}{r} 1 \\ \times 5 \\ \hline 5 \end{array}$$

In 5 days, 5 classes may visit the factory.

Rob got a baseball bat for his birthday.  
 He was up at bat 4 times, but he struck out each time. How many hits did he have?

$$\begin{array}{r} 0 + 0 + 0 + 0 = 0 \\ 4 \times 0 = 0 \end{array} \quad \begin{array}{r} 0 \\ \times 4 \\ \hline 0 \end{array}$$

In 4 times at bat, Rob had 0 hits.



### EXERCISES

Add or multiply.

1.  $1 + 1$  2
2.  $2 \times 1$  2
3.  $1 + 1 + 1$  3
4.  $3 \times 1$  3
5.  $1 + 1 + 1 + 1$  4
6.  $4 \times 1$  4
7.  $0 + 0$  0
8.  $2 \times 0$  0
9.  $0 + 0 + 0$  0
10.  $3 \times 0$  0
11.  $0 + 0 + 0 + 0$  0
12.  $4 \times 0$  0

Multiply.

13.  $\begin{array}{r} 1 \\ \times 5 \\ \hline 5 \end{array}$
14.  $\begin{array}{r} 1 \\ \times 6 \\ \hline 6 \end{array}$
15.  $\begin{array}{r} 1 \\ \times 7 \\ \hline 7 \end{array}$
16.  $\begin{array}{r} 1 \\ \times 8 \\ \hline 8 \end{array}$
17.  $\begin{array}{r} 1 \\ \times 9 \\ \hline 9 \end{array}$
18.  $\begin{array}{r} 0 \\ \times 5 \\ \hline 0 \end{array}$
19.  $\begin{array}{r} 0 \\ \times 6 \\ \hline 0 \end{array}$
20.  $\begin{array}{r} 0 \\ \times 7 \\ \hline 0 \end{array}$
21.  $\begin{array}{r} 0 \\ \times 8 \\ \hline 0 \end{array}$
22.  $\begin{array}{r} 0 \\ \times 9 \\ \hline 0 \end{array}$

### Using the Exercises

- Repeated additions and their related multiplications are paired for questions 1 to 12.
- Questions 13 to 22 provide practice in multiplying with 0 and 1.

## PRACTICE

Multiply.

1.  $\begin{array}{r} 5 \\ \times 0 \\ \hline 0 \end{array}$
2.  $\begin{array}{r} 0 \\ \times 5 \\ \hline 0 \end{array}$
3.  $\begin{array}{r} 2 \\ \times 0 \\ \hline 0 \end{array}$
4.  $\begin{array}{r} 1 \\ \times 0 \\ \hline 0 \end{array}$
5.  $\begin{array}{r} 0 \\ \times 0 \\ \hline 0 \end{array}$
6.  $\begin{array}{r} 5 \\ \times 1 \\ \hline 5 \end{array}$
7.  $\begin{array}{r} 1 \\ \times 4 \\ \hline 4 \end{array}$
8.  $\begin{array}{r} 8 \\ \times 1 \\ \hline 8 \end{array}$
9.  $\begin{array}{r} 1 \\ \times 1 \\ \hline 1 \end{array}$
10.  $\begin{array}{r} 5 \\ \times 1 \\ \hline 5 \end{array}$
11.  $\begin{array}{r} 8 \\ \times 1 \\ \hline 8 \end{array}$
12.  $\begin{array}{r} 0 \\ \times 5 \\ \hline 0 \end{array}$
13.  $\begin{array}{r} 9 \\ \times 1 \\ \hline 9 \end{array}$
14.  $\begin{array}{r} 1 \\ \times 3 \\ \hline 3 \end{array}$
15.  $\begin{array}{r} 6 \\ \times 0 \\ \hline 0 \end{array}$

16. Copy and complete the table.

	0	1	2	3	4	5	6	7	8	9
$\times 0$	0	0	0	0	0	0	0	0	0	0
$\times 1$	0	1	2	3	4	5	6	7	8	9

Solve.

17. Terrible Toys packs Dracula Dolls one to a box.  
How many dolls are there in a carton of 6 boxes? **6**
18. When 6 tea sets were packed, the covers for the teapots were forgotten. How many teapot covers were there in the 6 tea sets? **0**

## No Challenge

How much is  $0 \times 100$ ? **0**  
 $0 \times 1000$ ? **0**  
 $0 \times 10\,000$ ? **0**  
 $0 \times 100\,000$ ? **0**  
 0 times a million? **0**

How much is  $1 \times 100$ ? **100**  
 $1 \times 1000$ ? **1000**  
 $1 \times 10\,000$ ? **10\,000**  
 $1 \times 100\,000$ ? **100\,000**  
 1 times a million? **million**

101

## Assigning the Practice

Minimum: 1-18

Average: 1-18

Enriched: 1-18

## Reinforcement

1. Assign *No Challenge* at the bottom of page 101.

2. Have the students discover the pattern and complete.

2		5	1		4		2
1	4			1	6	3	
2	12	0	6	0		24	18

3. Ask the students to make a list of as many *names* for these numbers as they can. Display their results.

0	1	2	3	4	5
$6 - 6$ $5 \times 0$	$0 + 1$ $1 \times 1$	$2 \times 1$ $1 + 1$	$2 + 1$ $8 - 5$	$2 \times 2$	$1 \times 5$

## Enrichment

Ask the students to solve these equations. Remind them that the work inside the brackets is to be done first.

- a.  $75 + (5 \times 0) = \blacksquare$
- b.  $(212 - 212) \times 5 = \blacksquare$
- c.  $18 + (7 - 7) = \blacksquare$
- d.  $(46 \times 0) + 35 = \blacksquare$
- e.  $112 - (52 - 52) = \blacksquare$

## Extra Practice

## Worksheet A21

Pages 100-101

Complete the table.

1.	$\times$	2	4	7	5	0	3	8	1	9	6
	5	10	20	35	25	0	15	40	5	45	30
	1	2	4	7	5	0	3	8	1	9	6
	3	6	12	21	15	0	9	24	3	27	18
	2	4	8	14	10	0	6	16	2	18	12
	4	8	16	28	20	0	12	32	4	36	24
	0	0	0	0	0	0	0	0	0	0	0

Solve.

**\$6.00**

2. Discount Toys sells Goon Balls for \$1.00 each. How much will 6 cost?



# UNIT 5 LESSON 5

## Objective A22

Use 0 to 5 as factors in multiplication.

## Introducing the Lesson

Play the game called "Buzz". Begin with the 5-Buzz game. Students count by ones around the room. Each time a multiple of 5 is to be said, the student must say, "Buzz!"

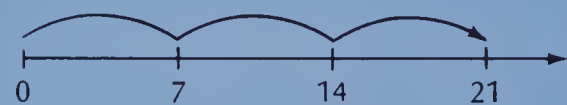
Also review counting by twos, threes, and fours by playing "Buzz".

## Teaching the Lesson

Read and discuss the lesson example at the top of page 102. Use a peg board and an elastic band to model the  $4 \times 9$  array. Explain that there are 4 rows of pegs. Ask how many pegs are in each row. Now, have the students count how many pegs there are altogether. They should recognize that  $4 \times 9 = 36$ . Show also that 9 fours is the same as  $9 \times 4$ , which yields a product equal to that of  $4 \times 9$ . Have the students name an addition equation for each, as well.

Distribute dot paper having several 5 by 10 arrays on each sheet. Write several multiplications on the chalkboard and ask the students to show them on their paper "peg boards".

Draw a number line to 50 on the chalkboard. Show how you can multiply with it.



3 jumps of 7 or  $3 \times 7 = 21$

# A Multiplication Table

Can you multiply on a peg board?

Multiply  $4 \times 9$ .

Put a piece of string or an elastic around a  $4 \times 9$  array of pegs. Count the number of pegs.



$$4 \times 9 = 36$$

$$\begin{array}{r} 9 \\ \times 4 \\ \hline 36 \end{array}$$

## EXERCISES

Multiply.

$$\begin{array}{r} 1. \quad 0 \\ \times 2 \\ \hline 0 \end{array}$$

$$\begin{array}{r} 2. \quad 1 \\ \times 2 \\ \hline 2 \end{array}$$

$$\begin{array}{r} 3. \quad 2 \\ \times 2 \\ \hline 4 \end{array}$$

$$\begin{array}{r} 4. \quad 3 \\ \times 2 \\ \hline 6 \end{array}$$

$$\begin{array}{r} 5. \quad 4 \\ \times 2 \\ \hline 8 \end{array}$$

$$\begin{array}{r} 6. \quad 5 \\ \times 2 \\ \hline 10 \end{array}$$

$$\begin{array}{r} 7. \quad 3 \\ \times 0 \\ \hline 0 \end{array}$$

$$\begin{array}{r} 8. \quad 3 \\ \times 1 \\ \hline 3 \end{array}$$

$$\begin{array}{r} 9. \quad 3 \\ \times 2 \\ \hline 6 \end{array}$$

$$\begin{array}{r} 10. \quad 3 \\ \times 3 \\ \hline 9 \end{array}$$

$$\begin{array}{r} 11. \quad 3 \\ \times 4 \\ \hline 12 \end{array}$$

$$\begin{array}{r} 12. \quad 3 \\ \times 5 \\ \hline 15 \end{array}$$

$$\begin{array}{r} 13. \quad 6 \\ \times 5 \\ \hline 30 \end{array}$$

$$\begin{array}{r} 14. \quad 5 \\ \times 6 \\ \hline 30 \end{array}$$

$$\begin{array}{r} 15. \quad 7 \\ \times 5 \\ \hline 35 \end{array}$$

$$\begin{array}{r} 16. \quad 5 \\ \times 7 \\ \hline 35 \end{array}$$

$$\begin{array}{r} 17. \quad 8 \\ \times 5 \\ \hline 40 \end{array}$$

$$\begin{array}{r} 18. \quad 5 \\ \times 8 \\ \hline 40 \end{array}$$

$$\begin{array}{r} 19. \quad 0 \\ \times 0 \\ \hline 0 \end{array}$$

$$\begin{array}{r} 20. \quad 1 \\ \times 1 \\ \hline 1 \end{array}$$

$$\begin{array}{r} 21. \quad 5 \\ \times 5 \\ \hline 25 \end{array}$$

$$\begin{array}{r} 22. \quad 3 \\ \times 3 \\ \hline 9 \end{array}$$

$$\begin{array}{r} 23. \quad 4 \\ \times 4 \\ \hline 16 \end{array}$$

$$\begin{array}{r} 24. \quad 5 \\ \times 5 \\ \hline 25 \end{array}$$

102

## Using the Exercises

- The questions should make the students aware of patterns that can be used to complete the multiplication table on page 103.
- Questions 1 to 6 include multiplications from a row on the table.
- Questions 7 to 12 include multiplications from a column on the table.
- Questions 13 to 24 include multiplications from diagonals on the table.

## PRACTICE

1. Copy and complete the table.

×	0	1	2	3	4	5	6	7	8	9
0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9
2	0	2	4	6	8	10	12	14	16	18
3	0	3	6	9	12	15	18	21	24	27
4	0	4	8	12	16	20	24	28	32	36
5	0	5	10	15	20	25	30	35	40	45
6	0	6	12	18	24	30				
7	0	7	14	21	28	35				
8	0	8	16	24	32	40				
9	0	9	18	27	36	45				

Multiply.

2.  $9 \times 4 = 36$     3.  $5 \times 8 = 40$     4.  $6 \times 5 = 30$     5.  $3 \times 7 = 21$   
 6.  $8 \times 2 = 16$     7.  $3 \times 9 = 27$     8.  $4 \times 8 = 32$     9.  $5 \times 5 = 25$

## REVIEW

Multiply.

- A19 1.  $4 \times 2 = 8$     2.  $2 \times 4 = 8$     3.  $8 \times 2 = 16$     4.  $5 \times 3 = 15$     5.  $3 \times 6 = 18$   
 A20 6.  $3 \times 4 = 12$     7.  $4 \times 6 = 24$     8.  $7 \times 4 = 28$     9.  $9 \times 5 = 45$     10.  $5 \times 5 = 25$   
 A21 11.  $4 \times 0 = 0$     12.  $0 \times 0 = 0$     13.  $0 \times 7 = 0$     14.  $5 \times 1 = 5$     15.  $1 \times 1 = 1$   
 A22 16.  $0 \times 1 = 0$     17.  $2 \times 3 = 6$     18.  $8 \times 4 = 32$     19.  $4 \times 0 = 0$     20.  $5 \times 8 = 40$

103

## Assigning the Practice

Minimum: 1-9

Average: 1-9

Enriched: 1-9

## Review Exercises

Questions	Objective	Pages
1-5	A19	96-97
6-10	A20	98-99
11-15	A21	100-101
16-20	A22	102-103

## Reinforcement

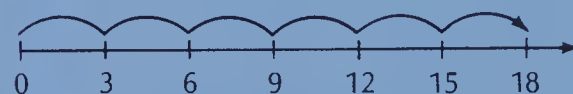
1. Provide a flash card drill of the basic facts studied thus far.

2. Distribute dot array paper and ask the students to circle the appropriate dot patterns for these multiplications.

- $3 \times 3$      $7 \times 2$      $9 \times 4$      $5 \times 8$   
 $4 \times 3$      $2 \times 9$      $5 \times 7$      $8 \times 4$   
 $8 \times 2$      $5 \times 5$      $4 \times 6$      $9 \times 5$

## Enrichment

1. Display this example of multiplying with a number line.



6 jumps of 3.

$$6 \times 3 = 18$$

Then ask the students to make a number line for these multiplication facts.

- $3 \times 3$      $4 \times 8$      $5 \times 4$      $9 \times 3$   
 $2 \times 6$      $8 \times 5$      $4 \times 7$      $8 \times 2$

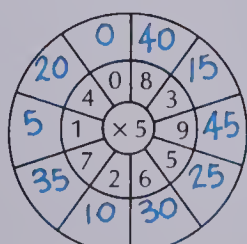
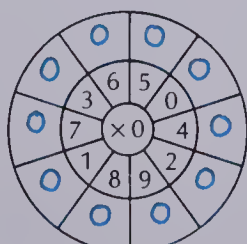
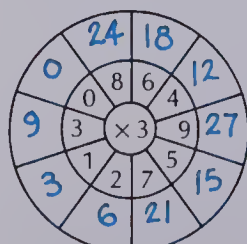
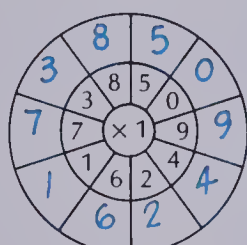
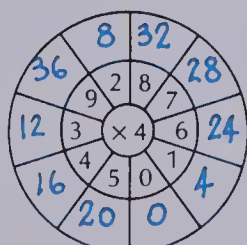
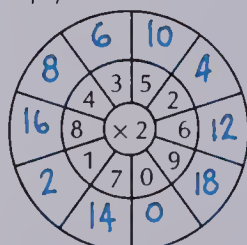
2. Ask the students to fill in the blank cells with numbers to make the statement true. There are several possibilities.

$$\square \times \square \times \square = 24$$

$$\square \times \square \times \square = 36$$

## Extra Practice

Multiply.



## Worksheet A22

Pages 102-103

# UNIT 5 LESSON 6

## Objective A23

Use 6 and 7 as factors in multiplication.

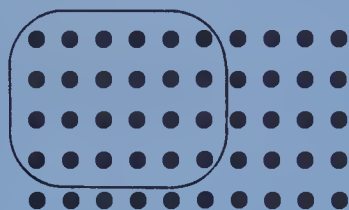
### Introducing the Lesson

Review counting by sixes and sevens. Ask the students to count using a number line and/or a 100 chart to look for patterns. Vary their counting so that it doesn't always begin at six or seven.

- Count by sixes from 12 to 30.
- Count by sevens from 21 to 49.

### Teaching the Lesson

Discuss the problems at the top of page 104 and at the same time use the peg board to model the required multiplications. For example:

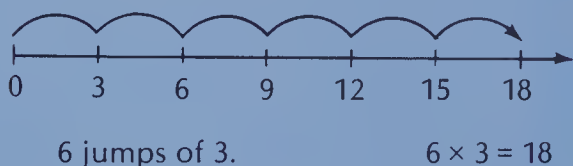


Ask a student to circle the appropriate pegs for the multiplication,  $4 \times 6$ . Point out that there are 4 rows with 6 in each row or 24 pegs in all. Show also the multiplication  $6 \times 4$  on the peg board. Let the students see that a change in the order of the factors does not change the product,  $4 \times 6 = 6 \times 4$ . Students should be able to write a repeated addition for each example,  $6 + 6 + 6 + 6 = 4 + 4 + 4 + 4 + 4 + 4$ .

Model several multiplication facts for 6 and 7 with the peg board.

Display a 100 chart. Show how it can be used to multiply with 6 and 7. Look for patterns.

Use a number line to demonstrate multiplication jumps.



## 6 and 7 as Factors

A store displayed its outer space toys on 4 shelves. There were 6 toys on each shelf. How many outer space toys were there?

$$6 + 6 + 6 + 6 = 24$$

$$4 \times 6 = 24$$

$$\begin{array}{r} 6 \\ \times 4 \\ \hline 24 \end{array}$$

There were 24 space toys on the shelves.

The store received some more space toys, so they put 7 toys on each shelf.

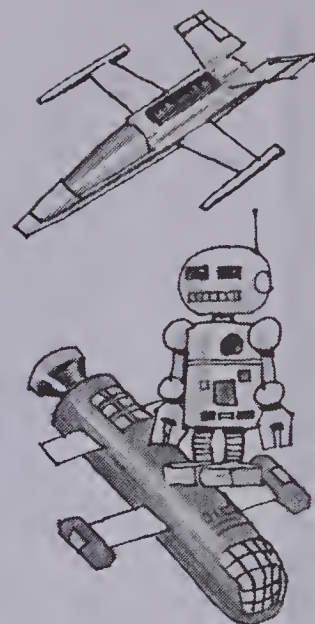
Then how many space toys were there?

$$7 + 7 + 7 + 7 = 28$$

$$4 \times 7 = 28$$

$$\begin{array}{r} 7 \\ \times 4 \\ \hline 28 \end{array}$$

There were 28 space toys on the shelves.



### EXERCISES

Add or multiply.

- $6 + 6 + 6 + 6 + 6 = 30$
- $5 \times 6 = 30$
- $6 \times 5 = 30$
- $7 + 7 + 7 + 7 + 7 = 35$
- $5 \times 7 = 35$
- $7 \times 5 = 35$

Multiply.

- $\begin{array}{r} 6 \\ \times 6 \\ \hline 36 \end{array}$
- $\begin{array}{r} 6 \\ \times 7 \\ \hline 42 \end{array}$
- $\begin{array}{r} 6 \\ \times 8 \\ \hline 48 \end{array}$
- $\begin{array}{r} 6 \\ \times 9 \\ \hline 54 \end{array}$
- $\begin{array}{r} 9 \\ \times 6 \\ \hline 54 \end{array}$
- $\begin{array}{r} 7 \\ \times 6 \\ \hline 42 \end{array}$
- $\begin{array}{r} 7 \\ \times 7 \\ \hline 49 \end{array}$
- $\begin{array}{r} 7 \\ \times 8 \\ \hline 56 \end{array}$
- $\begin{array}{r} 7 \\ \times 9 \\ \hline 63 \end{array}$
- $\begin{array}{r} 9 \\ \times 7 \\ \hline 63 \end{array}$

104

### Using the Exercises

- Questions 1 to 6 demonstrate the relation of repeated addition to multiplication and the commutativity of factors.
- Questions 7 to 16 provide practice in multiplying with 6 and 7. If students experience difficulties, have them use dot paper or a number line.



## PRACTICE

Multiply.

1.  $\begin{array}{r} 7 \\ \times 7 \\ \hline 49 \end{array}$
2.  $\begin{array}{r} 6 \\ \times 5 \\ \hline 30 \end{array}$
3.  $\begin{array}{r} 8 \\ \times 6 \\ \hline 48 \end{array}$
4.  $\begin{array}{r} 6 \\ \times 6 \\ \hline 36 \end{array}$
5.  $\begin{array}{r} 7 \\ \times 6 \\ \hline 42 \end{array}$
6.  $\begin{array}{r} 6 \\ \times 9 \\ \hline 54 \end{array}$
7.  $\begin{array}{r} 7 \\ \times 5 \\ \hline 35 \end{array}$
8.  $\begin{array}{r} 4 \\ \times 7 \\ \hline 28 \end{array}$
9.  $\begin{array}{r} 7 \\ \times 5 \\ \hline 35 \end{array}$
10.  $\begin{array}{r} 8 \\ \times 7 \\ \hline 56 \end{array}$
11.  $\begin{array}{r} 7 \\ \times 6 \\ \hline 42 \end{array}$
12.  $\begin{array}{r} 9 \\ \times 7 \\ \hline 63 \end{array}$
13.  $\begin{array}{r} 9 \\ \times 6 \\ \hline 54 \end{array}$
14.  $\begin{array}{r} 6 \\ \times 7 \\ \hline 42 \end{array}$
15.  $\begin{array}{r} 8 \\ \times 6 \\ \hline 48 \end{array}$

16. Copy and complete the table.

	0	1	2	3	4	5	6	7	8	9
$\times 6$	0	6	12	18	24	30	36	42	48	54
$\times 7$	0	7	14	21	28	35	42	49	56	63

Solve.

17. Toycraft sells a Bionic Cat for \$7.  
How much should they charge for 9 cats? **\$63**
18. The Toycraft factory has been working  
10 hours a day 7 days a week for 8 weeks  
to keep up with orders.  
How many days in a row have they been open? **56**

## For Consumers

Tempting Toys is offering rubber tarantulas on sale at 3 for \$5. How much should they charge a store that orders 15 rubber tarantulas? **\$25**



105

## Assigning the Practice

Minimum: 1-18

Average: 1-18

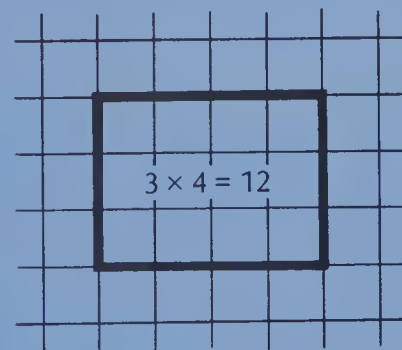
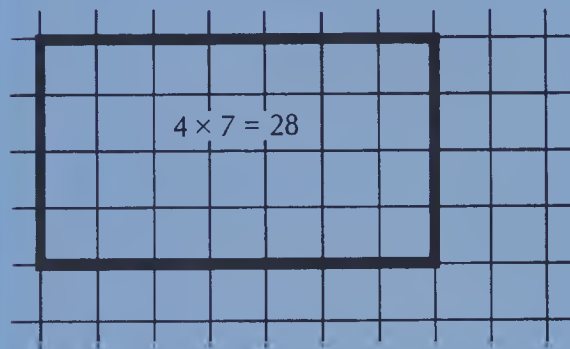
Enriched: 1-18

## Reinforcement

1. Assign *For Consumers* at the bottom of page 105.

2. Have the students prepare their own set of multiplication fact flash cards with index cards. On one side of the card they write a fact and on the other side they write its product. All facts involving 0, 1, 2, 3, 4, 5, 6, and 7 should be prepared. As new facts are introduced, new cards can be made.

3. Distribute large sheets of graph paper. Have the students work in small groups preparing grids showing multiplication facts learned thus far. Display their work.



## Enrichment

Have the students complete the counting and describe the patterns.

- a. Count by 6s to 60.
- b. Count by 60s to 600.
- c. Count by 600s to 6000.
- d. Count by 7s to 70.
- e. Count by 70s to 700.
- f. Count by 700s to 7000.

## Extra Practice

Multiply.

1.  $\begin{array}{r} 3 \\ \times 6 \\ \hline 18 \end{array}$
2.  $\begin{array}{r} 6 \\ \times 8 \\ \hline 48 \end{array}$
3.  $\begin{array}{r} 7 \\ \times 6 \\ \hline 42 \end{array}$
4.  $\begin{array}{r} 6 \\ \times 5 \\ \hline 30 \end{array}$
5.  $\begin{array}{r} 9 \\ \times 6 \\ \hline 54 \end{array}$
6.  $\begin{array}{r} 4 \\ \times 7 \\ \hline 28 \end{array}$
7.  $\begin{array}{r} 7 \\ \times 5 \\ \hline 35 \end{array}$
8.  $\begin{array}{r} 8 \\ \times 7 \\ \hline 56 \end{array}$
9.  $\begin{array}{r} 3 \\ \times 7 \\ \hline 21 \end{array}$
10.  $\begin{array}{r} 7 \\ \times 7 \\ \hline 49 \end{array}$
11.  $\begin{array}{r} 6 \\ \times 6 \\ \hline 36 \end{array}$
12.  $\begin{array}{r} 9 \\ \times 7 \\ \hline 63 \end{array}$
13.  $\begin{array}{r} 6 \\ \times 7 \\ \hline 42 \end{array}$
14.  $\begin{array}{r} 6 \\ \times 9 \\ \hline 54 \end{array}$
15.  $\begin{array}{r} 7 \\ \times 4 \\ \hline 28 \end{array}$

Solve.

16. Sports World packs six barbell pieces in one carton. Each piece has a mass of 5 kg. What is the total mass of the carton? **30 kg**

## Worksheet A23

Pages 104-105

# UNIT 5 LESSON 7

## Objective A24

Use 8 and 9 as factors in multiplication.

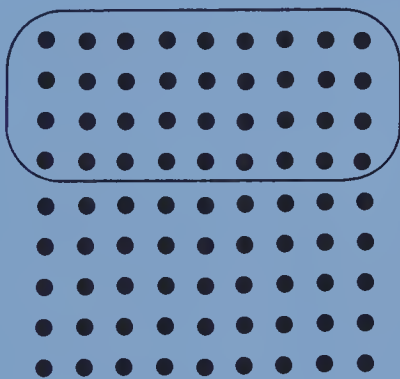
### Introducing the Lesson

Review the multiplication facts learned thus far with a blank chalkboard multiplication table. Ask the students to fill it in. Point out how many of the multiplications with 8 and 9 have already been studied.

Review counting by eights and by nines. At first, use a number line or a 100 chart as an aid.

### Teaching the Lesson

Read and discuss each problem at the top of page 106. Model the required multiplications with a peg board. For example:



4 rows of 9 or  $4 \times 9 = 36$

It is worthwhile to point out that if we know the fact  $4 \times 9 = 36$ , then we also know  $9 \times 4 = 36$ .

Repeat this activity with as many multiplications with 8 and 9 as you think necessary. Be sure to include the facts which are new in the lesson:  $8 \times 8$ ,  $8 \times 9$ , and  $9 \times 9$ .

Have the students demonstrate multiplication facts with 8 and 9 on the number line also.

## 8 and 9 as Factors

A novelty company sells bags of cat's eye marbles.

There are 8 marbles in a bag.

How many marbles are there in 5 bags?

$$\begin{aligned} 8 + 8 + 8 + 8 + 8 &= 40 \\ 5 \times 8 &= 40 \end{aligned}$$

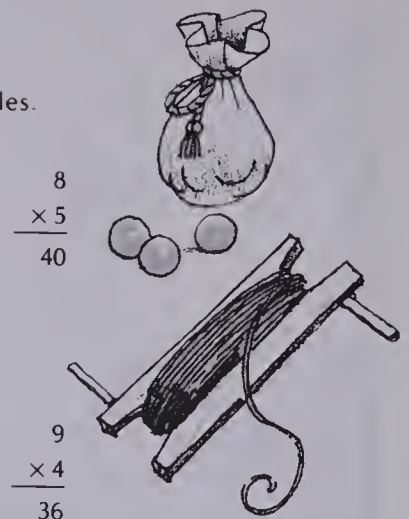
In 5 bags there are 40 marbles.

Their kite string rollers are packed 9 in a box.

How many rollers are there in 4 boxes?

$$\begin{aligned} 9 + 9 + 9 + 9 &= 36 \\ 4 \times 9 &= 36 \end{aligned}$$

In 4 boxes there are 36 rollers.



$$\begin{array}{r} 8 \\ \times 5 \\ \hline 40 \end{array}$$

$$\begin{array}{r} 9 \\ \times 4 \\ \hline 36 \end{array}$$

### EXERCISES

Add or multiply.

- |                                  |                       |                       |
|----------------------------------|-----------------------|-----------------------|
| 1. $8 + 8 + 8 + 8 + 8 = 40$      | 2. $5 \times 8 = 40$  | 3. $8 \times 5 = 40$  |
| 4. $8 + 8 + 8 + 8 + 8 + 8 = 48$  | 5. $6 \times 8 = 48$  | 6. $8 \times 6 = 48$  |
| 7. $9 + 9 + 9 + 9 + 9 = 45$      | 8. $5 \times 9 = 45$  | 9. $9 \times 5 = 45$  |
| 10. $9 + 9 + 9 + 9 + 9 + 9 = 54$ | 11. $6 \times 9 = 54$ | 12. $9 \times 6 = 54$ |

Multiply.

- |   |   |   |   |   |
|---|---|---|---|---|
| 13. $\begin{array}{r} 8 \\ \times 7 \\ \hline 56 \end{array}$ | 14. $\begin{array}{r} 8 \\ \times 8 \\ \hline 64 \end{array}$ | 15. $\begin{array}{r} 8 \\ \times 9 \\ \hline 72 \end{array}$ | 16. $\begin{array}{r} 6 \\ \times 8 \\ \hline 48 \end{array}$ | 17. $\begin{array}{r} 7 \\ \times 8 \\ \hline 56 \end{array}$ |
| 18. $\begin{array}{r} 9 \\ \times 7 \\ \hline 63 \end{array}$ | 19. $\begin{array}{r} 9 \\ \times 8 \\ \hline 72 \end{array}$ | 20. $\begin{array}{r} 9 \\ \times 9 \\ \hline 81 \end{array}$ | 21. $\begin{array}{r} 6 \\ \times 9 \\ \hline 54 \end{array}$ | 22. $\begin{array}{r} 7 \\ \times 9 \\ \hline 63 \end{array}$ |

### Using the Exercises

- Questions 1 to 12 demonstrate the relation of repeated addition to multiplication facts with 8 and 9 and the commutativity of factors.
- Questions 13 to 22 provide practice in multiplying with 8 and 9.

## PRACTICE

Multiply.

1.  $\begin{array}{r} 2 \\ \times 8 \\ \hline 16 \end{array}$
2.  $\begin{array}{r} 8 \\ \times 5 \\ \hline 40 \end{array}$
3.  $\begin{array}{r} 6 \\ \times 8 \\ \hline 48 \end{array}$
4.  $\begin{array}{r} 8 \\ \times 8 \\ \hline 64 \end{array}$
5.  $\begin{array}{r} 7 \\ \times 8 \\ \hline 56 \end{array}$
6.  $\begin{array}{r} 9 \\ \times 8 \\ \hline 72 \end{array}$
7.  $\begin{array}{r} 3 \\ \times 9 \\ \hline 27 \end{array}$
8.  $\begin{array}{r} 9 \\ \times 6 \\ \hline 54 \end{array}$
9.  $\begin{array}{r} 4 \\ \times 9 \\ \hline 36 \end{array}$
10.  $\begin{array}{r} 9 \\ \times 9 \\ \hline 81 \end{array}$
11.  $\begin{array}{r} 8 \\ \times 9 \\ \hline 72 \end{array}$
12.  $\begin{array}{r} 9 \\ \times 5 \\ \hline 45 \end{array}$
13.  $\begin{array}{r} 6 \\ \times 8 \\ \hline 48 \end{array}$
14.  $\begin{array}{r} 7 \\ \times 9 \\ \hline 63 \end{array}$
15.  $\begin{array}{r} 8 \\ \times 8 \\ \hline 64 \end{array}$

16. Write the multiples of 8 from 8 to 80.

8, 16, 24, 32, 40, 48, 56, 64, 72, 80

17. Write the multiples of 9 from 9 to 90.

9, 18, 27, 36, 45, 54, 63, 72, 81, 90

Solve.

18. ABC Novelties packages water pistols 8 to a box.

How many water pistols are there in 5 boxes? 40

19. The Outer Space game sells for \$9.

How much would 2 games cost? \$18

## Sparring Partner

Play with a partner.

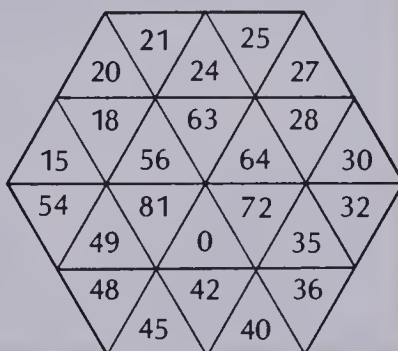
Each player needs a set of markers.

Select any two numbers from 0 to 9.

Find the product of the numbers.

Put a marker on the triangle which contains the product.

Take turns. The winner is the first to get 4 markers in a row.



107

## Assigning the Practice

Minimum: 1-19

Average: 1-19

Enriched: 1-19

## Reinforcement

1. Assign *Sparring Partner* at the bottom of page 107.

2. Have the students update the flash cards they made in Lesson 6, Reinforcement. Then ask them to make a 5 by 5 grid and place the following numbers in the squares in any order.

36	25	12	9	20
18	63	8	72	42
45	30	28	21	15
49	16	81	27	35
54	64	56	24	40

Hold up a fact flash card and have the students cover with a marker the square on their grid containing the correct answer. When 5 squares in a row, column, or diagonal are covered, a winner can be declared.

3. Play "Buzz" with the multiples of 8 and 9. Directions for play were given in *Introducing the Lesson*, Lesson 5.

4. Play "Travel." Two students compete to give the correct answer to a question given by the teacher. The student who says the correct answer first, travels on to compete with the next student in the row. Whoever wins, travels. The other one sits in the seat previously occupied by the winner.

## Enrichment

Have the students determine the missing factors.

- a.  $6 \times \square = 48$
- b.  $9 \times \square = 63$
- c.  $\square \times 8 = 56$
- d.  $\square \times 5 = 30$
- e.  $\square \times 4 \times \square = 64$
- f.  $6 \times \square \times \square = 42$

## Extra Practice

Complete.

1.	×	3	9	0	7	2	5	4	1	6	8
4	12	36	0	28	8	20	16	4	24	32	
2	6	18	0	14	4	10	8	2	12	16	
7	21	63	0	49	14	35	28	7	42	56	
6	18	54	0	42	12	30	24	6	36	48	
9	27	81	0	63	18	45	36	9	54	72	
1	3	9	0	7	2	5	4	1	6	8	
5	15	45	0	35	10	25	20	5	30	40	
3	9	27	0	21	6	15	12	3	18	24	
8	24	72	0	56	16	40	32	8	48	64	
0	0	0	0	0	0	0	0	0	0	0	

Solve.

2. For a window display, there are 8 toys on one shelf. How many toys would there be on 6 shelves at that rate? 48

## Worksheet A24

Pages 106-107



# UNIT 5 LESSON 8

## Objective A25

Use 10 as a factor in multiplication.

### Introducing the Lesson

Review counting by tens. Let the students count as far as they can with play ten-dollar bills. List their counting on the chalkboard. Have them note the patterns.

### Teaching the Lesson

Read and discuss the problem at the top of page 108. Model the multiplication with place-value number blocks on the overhead projector.



3 rods; 10 in each rod  
3 tens  
 $3 \times 10 = 30$

Model  $10 \times 3$  with number blocks.



10 groups; 3 in each group  
10 threes  
 $10 \times 3 = 30$

Write several multiplications with 10 on the chalkboard. Ask individual students to model them with the number blocks.

Ask the students to suggest a way to multiply with ten quickly. Through discussion, elicit this shortcut: multiply the number by one and annex a zero. Call out several one-digit numbers for the students to mentally multiply by 10. If the students are ready, extend these mental drills to two- and three-digit numbers as well.

## 10 as a Factor

Louise and Peter were asked to arrange 100 chairs in the auditorium for a magic show.

They decided to put the chairs in rows of 10.

When they had set up 3 rows, how many chairs were there?

$$10 + 10 + 10 = 30$$

$$3 \text{ tens} = 30$$

$$3 \times 10 = 30$$

$$\begin{array}{r} 10 \\ \times 3 \\ \hline 30 \end{array}$$

In 3 rows there were 30 chairs.



### EXERCISES

Copy and complete the equations.

1. 4 tens = ■ 40

2.  $4 \times 10 =$  ■ 40

3.  $10 \times 4 =$  ■ 40

4. 5 tens = ■ 50

5.  $5 \times 10 =$  ■ 50

6.  $10 \times 5 =$  ■ 50

Multiply.

7.  $\begin{array}{r} 10 \\ \times 6 \\ \hline 60 \end{array}$

8.  $\begin{array}{r} 10 \\ \times 7 \\ \hline 70 \end{array}$

9.  $\begin{array}{r} 10 \\ \times 8 \\ \hline 80 \end{array}$

10.  $\begin{array}{r} 10 \\ \times 9 \\ \hline 90 \end{array}$

11.  $\begin{array}{r} 10 \\ \times 10 \\ \hline 100 \end{array}$

108

### Using the Exercises

- Questions 1 to 6 demonstrate the commutativity of multiplication.
- Questions 7 to 10 give practice in multiplying with ten. Students should be able to use the shortcut mentioned in the lesson to solve these.

## PRACTICE

Multiply.

1.  $\begin{array}{r} 10 \\ \times 3 \\ \hline 30 \end{array}$
2.  $\begin{array}{r} 10 \\ \times 5 \\ \hline 50 \end{array}$
3.  $\begin{array}{r} 10 \\ \times 7 \\ \hline 70 \end{array}$
4.  $\begin{array}{r} 10 \\ \times 4 \\ \hline 40 \end{array}$
5.  $\begin{array}{r} 10 \\ \times 6 \\ \hline 60 \end{array}$
6.  $\begin{array}{r} 2 \\ \times 10 \\ \hline 20 \end{array}$
7.  $\begin{array}{r} 6 \\ \times 10 \\ \hline 60 \end{array}$
8.  $\begin{array}{r} 9 \\ \times 10 \\ \hline 90 \end{array}$
9.  $\begin{array}{r} 0 \\ \times 10 \\ \hline 0 \end{array}$
10.  $\begin{array}{r} 8 \\ \times 10 \\ \hline 80 \end{array}$

11. Make a table for the 10s.

$\times$	0	1	2	3	4	5	6	7	8	9	10
10	0	10	20	30	40	50	60	70	80	90	100

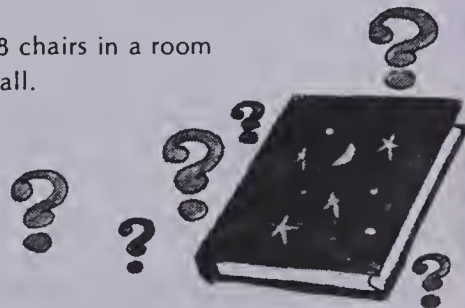
Solve.

12. By 1:00 o'clock Lou and Peter had set up 7 rows of 10 chairs each. How many chairs had they set up? 70
13. Goodtime Games sells a Counter Spy game for \$7. How much should the company charge a store that orders 10 of the games? \$70
14. There are 10 bowling pins in a set. How many bowling pins are there in 10 sets? 100

## Brainteaser

A book of tricks shows how to arrange 8 chairs in a room so that there are 3 chairs along every wall.

Show how the chairs are placed.



109

## Assigning the Practice

Minimum: 1-14

Average: 1-14

Enriched: 1-14

## Reinforcement

1. Assign *Brainteaser* at the bottom of page 109.
2. Provide sheets of graph paper. Ask the students to shade bars of ten on the graph paper to illustrate the multiplication facts with ten.
3. Place different amounts of play ten-dollar bills in several envelopes. Have the students count to find the total amount of money in each envelope.
4. Ask the students to find the number that is:
  - a. ten times more than 3.
  - b. ten times greater than 7.
  - c. ten times larger than 8.
  - d. ten times bigger than 6.

## Enrichment

Make the following game board and prepare several sets of numeral cards. Have the students play this card game.

$\square\square$
$\times 10$
<hr/>

Players set a three-digit target number, for example, 500. Numeral cards are turned upside down. In turn, players draw two cards and place them on the blank game board cells. He or she then names the product. After each player has had one turn, the player having a product closest to the target number gets a point. Then another round of play starts. The first player to get 5 points wins.

## Extra Practice

Multiply.

$\times$	4	6	1	0	9	5	8	10	3	7	2
1	4	6	1	0	9	5	8	10	3	7	2
10	40	60	10	0	90	50	80	100	30	70	20

2.  $10 \times 2 = \underline{20}$
3.  $4 \times 10 = \underline{40}$
4.  $10 \times 10 = \underline{100}$
5.  $6 \times 10 = \underline{60}$
6.  $10 \times 9 = \underline{90}$
7.  $7 \times 10 = \underline{70}$

Solve.

8. Goodtime Games pays its sales staff \$5.00 an hour. How much would a staff member earn after 10 h of work? \$50.00

## Worksheet A25

Pages 108-109

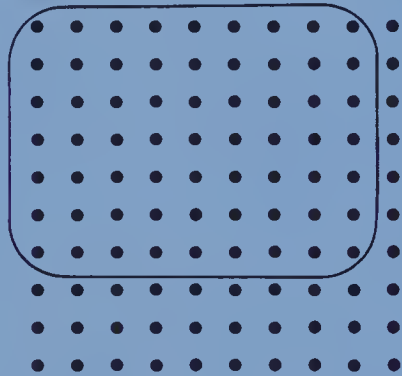
UNIT 5 LESSON 9

Objective A26

Use 0 to 10 as factors in multiplication.

Introducing the Lesson

Review the multiplication facts learned thus far with a peg board (as shown at the top of page 110.) Choose facts that seem particularly difficult for the students to learn and ask individual students to model them. For each fact discuss the number of rows that are circled and how many pegs are in each row; write the fact in vertical and horizontal format; and discuss the related fact that is generated when the order of the factors is changed.



7 rows of 9 or 7 nines  
 $7 \times 9 = 63$

For weaker students, make (or have them make) a 10 × 10 table on cardboard or Bristol board as a “crutch” to be used until they have mastered the facts.

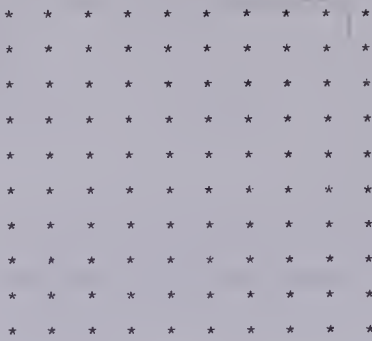
Teaching the Lesson

Provide a flash card drill of the basic multiplication facts for individuals, small groups, and the entire class.

- a. Individual students can flash their own set of cards for a partner, and vice versa.
- b. Students can be separated into small groups or teams. Cards can be flashed to one group at a time for two minutes. Members of the group take turns answering. See which group has the most correct answers in that time.
- c. Flash the fact cards for the entire class to respond to together.

A Multiplication Table to 10 × 10

What is the product of 8 and 9?  
Find the answer on a 10 by 10 peg board.



$8 \times 9 = 72$   
 $9 \times 8 = 72$

$$\begin{array}{r} 9 \\ \times 8 \\ \hline 72 \end{array}$$

$$\begin{array}{r} 8 \\ \times 9 \\ \hline 72 \end{array}$$

EXERCISES

Multiply.

1. $\begin{array}{r} 5 \\ \times 7 \\ \hline 35 \end{array}$	2. $\begin{array}{r} 6 \\ \times 7 \\ \hline 42 \end{array}$	3. $\begin{array}{r} 7 \\ \times 7 \\ \hline 49 \end{array}$	4. $\begin{array}{r} 8 \\ \times 7 \\ \hline 56 \end{array}$	5. $\begin{array}{r} 9 \\ \times 7 \\ \hline 63 \end{array}$	6. $\begin{array}{r} 10 \\ \times 7 \\ \hline 70 \end{array}$
7. $\begin{array}{r} 8 \\ \times 5 \\ \hline 40 \end{array}$	8. $\begin{array}{r} 8 \\ \times 6 \\ \hline 48 \end{array}$	9. $\begin{array}{r} 8 \\ \times 7 \\ \hline 56 \end{array}$	10. $\begin{array}{r} 8 \\ \times 8 \\ \hline 64 \end{array}$	11. $\begin{array}{r} 8 \\ \times 9 \\ \hline 72 \end{array}$	12. $\begin{array}{r} 8 \\ \times 10 \\ \hline 80 \end{array}$
13. $\begin{array}{r} 6 \\ \times 7 \\ \hline 42 \end{array}$	14. $\begin{array}{r} 7 \\ \times 6 \\ \hline 42 \end{array}$	15. $\begin{array}{r} 7 \\ \times 8 \\ \hline 56 \end{array}$	16. $\begin{array}{r} 8 \\ \times 7 \\ \hline 56 \end{array}$	17. $\begin{array}{r} 8 \\ \times 9 \\ \hline 72 \end{array}$	18. $\begin{array}{r} 9 \\ \times 8 \\ \hline 72 \end{array}$
19. $\begin{array}{r} 5 \\ \times 5 \\ \hline 25 \end{array}$	20. $\begin{array}{r} 6 \\ \times 6 \\ \hline 36 \end{array}$	21. $\begin{array}{r} 7 \\ \times 7 \\ \hline 49 \end{array}$	22. $\begin{array}{r} 8 \\ \times 8 \\ \hline 64 \end{array}$	23. $\begin{array}{r} 9 \\ \times 9 \\ \hline 81 \end{array}$	24. $\begin{array}{r} 10 \\ \times 10 \\ \hline 100 \end{array}$

Using the Exercises

- The questions should make the students aware of patterns that can be used to complete the multiplication table on page 110.
- Questions 1 to 6 include multiplications from a row on the table.
- Questions 7 to 12 include multiplications from a column on the table.
- Questions 13 to 24 include multiplications from diagonals on the table.



## PRACTICE

1. Copy and complete the table.

×	0	1	2	3	4	5	6	7	8	9	10
0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10
2	0	2	4	6	8	10	12	14	16	18	20
3	0	3	6	9	12	15	18	21	24	27	30
4	0	4	8	12	16	20	24	28	32	36	40
5	0	5	10	15	20	25	30	35	40	45	50
6	0	6	12	18	24	30	36	42	48	54	60
7	0	7	14	21	28	35	42	49	56	63	70
8	0	8	16	24	32	40	48	56	64	72	80
9	0	9	18	27	36	45	54	63	72	81	90
10	0	10	20	30	40	50	60	70	80	90	100

Multiply.

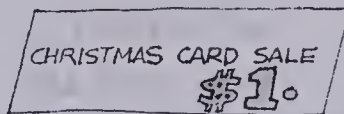
- |   |   |   |   |  |
|---|---|---|---|--|
| 2. $\begin{array}{r} 4 \\ \times 4 \\ \hline 16 \end{array}$  | 3. $\begin{array}{r} 7 \\ \times 5 \\ \hline 35 \end{array}$  | 4. $\begin{array}{r} 5 \\ \times 3 \\ \hline 15 \end{array}$  | 5. $\begin{array}{r} 9 \\ \times 2 \\ \hline 18 \end{array}$  | 6. $\begin{array}{r} 6 \\ \times 4 \\ \hline 24 \end{array}$   |
| 7. $\begin{array}{r} 3 \\ \times 7 \\ \hline 21 \end{array}$  | 8. $\begin{array}{r} 5 \\ \times 6 \\ \hline 30 \end{array}$  | 9. $\begin{array}{r} 2 \\ \times 8 \\ \hline 16 \end{array}$  | 10. $\begin{array}{r} 4 \\ \times 9 \\ \hline 36 \end{array}$ | 11. $\begin{array}{r} 4 \\ \times 7 \\ \hline 28 \end{array}$  |
| 12. $\begin{array}{r} 7 \\ \times 8 \\ \hline 56 \end{array}$ | 13. $\begin{array}{r} 5 \\ \times 9 \\ \hline 45 \end{array}$ | 14. $\begin{array}{r} 8 \\ \times 6 \\ \hline 48 \end{array}$ | 15. $\begin{array}{r} 6 \\ \times 7 \\ \hline 42 \end{array}$ | 16. $\begin{array}{r} 10 \\ \times 8 \\ \hline 80 \end{array}$ |
| 17. $\begin{array}{r} 4 \\ \times 5 \\ \hline 20 \end{array}$ | 18. $\begin{array}{r} 8 \\ \times 8 \\ \hline 64 \end{array}$ | 19. $\begin{array}{r} 6 \\ \times 9 \\ \hline 54 \end{array}$ | 20. $\begin{array}{r} 9 \\ \times 7 \\ \hline 63 \end{array}$ | 21. $\begin{array}{r} 5 \\ \times 10 \\ \hline 50 \end{array}$ |

### For Consumers

Which is a better bargain:

- 6 boxes with 10 cards to a box,  
or 7 boxes with 8 cards to a box?

6 boxes



111

## Assigning the Practice

Minimum: 1-21

Average: 1-21

Enriched: 1-21

## Reinforcement

1. Assign *For Consumers* at the bottom of page 111.

2. Make a domino game using multiplication facts.

$9 \times 6$	28
$7 \times 4$	15

3. Have the students find the missing factors in these charts.

×	6		8		5		7	
		4		7		9		6
	42	36	64	21	40	81	49	54

×	9		6		10		5	
		7		8		8		9
	45	56	36	32	10	72	35	90

4. Prepare a worksheet having four 100 charts. Ask the students to circle the multiples of 6 on one chart, the multiples of 7 on the next chart, and then the multiples of 8 and 9 on the remaining two charts. Ask the students to write a multiplication fact for each circled multiple.

## Enrichment

Have the students choose the correct comparison sign:  $<$ ,  $=$ , or  $>$ .

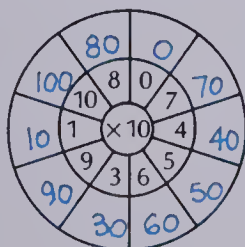
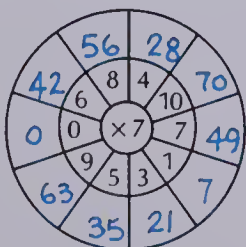
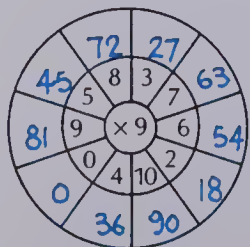
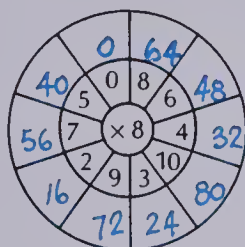
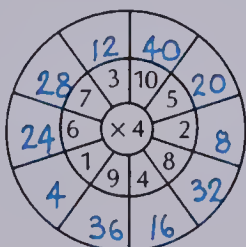
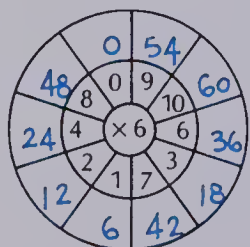
- $7 \times 4 \bullet 3 \times 9$
- $6 \times 8 \bullet 7 \times 7$
- $9 \times 6 \bullet 7 \times 8$
- $8 \times 8 \bullet 9 \times 7$
- $2 \times 5 \times 6 \bullet 6 \times 9 \times 0$
- $3 \times 3 \times 9 \bullet 1 \times 10 \times 8$

### Extra Practice

Multiply.

### Worksheet A26

Pages 110-111



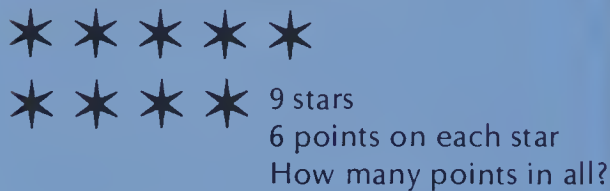
## UNIT 5 LESSON 10

### Objective PS5

Solve simple multiplication problems.

### Introducing the Lesson

Show a few picture problems on the overhead projector or on the chalkboard. These should put the emphasis on the process for solving the problem and not tax reading ability. Discuss the facts given and what there is to be found out for each. Decide on the correct operation for solving each problem.



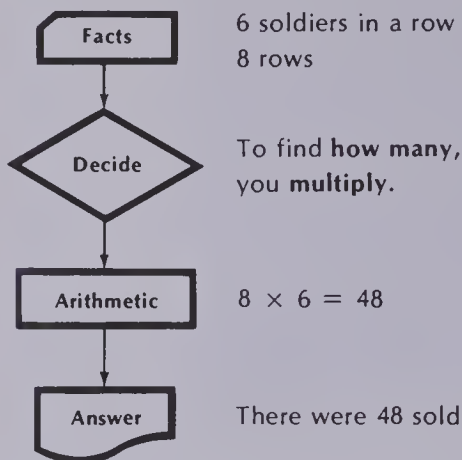
### Teaching the Lesson

Read and discuss the word problem at the top of page 112. Point out the four problem-solving steps. Stress the importance of **analysing** a word problem before solving it. Make a classroom chart for easy reference to the steps.

Let the students make up their own problems and say them to the class. As the problems are solved, see that the students follow the problem-solving steps outlined. Encourage the students to draw a picture of the problem they are solving.

## Solving Multiplication Problems

Sylvia received a set of toy soldiers. She set them up with 6 soldiers in a row. How many soldiers were there in 8 rows?



### EXERCISES

Follow the steps to solve these problems.

- Ron plays in a Drum and Bugle Corps. The corps marches with 4 players in a row. How many players are there in 9 rows? **36**
- Some members of a band need new caps. Caps cost \$9 each. How much would 8 caps cost? **\$72**
- People lined up to see a parade. At one spot on the parade route, there were 3 rows of 10 people. How many people were lined up there? **30**
- Each morning before school Ron practises for 10 minutes. How much does he practise in 5 mornings? **50 min**

### Using the Exercises

- Questions 1 to 4 provide the students with an opportunity to use the four problem-solving steps. Do the problems as a class activity, analysing each problem with the students.

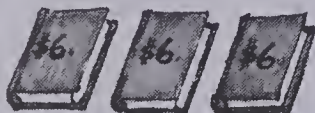
## PRACTICE

Solve.

- There are 10 jacks in each set.  
How many jacks are there in 6 sets? **60**
- The Belinda doll has 4 dresses and 2 hats.  
How many dresses are needed for 7 dolls? **28**
- One Comet game costs \$5.  
How much do 10 Comet games cost? **\$50**
- Creative Arts packs modelling clay in 2 kg bags.  
How much clay is there in 9 bags? **18 kg**

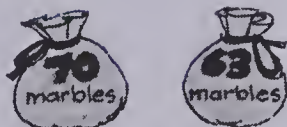
Use the facts in the pictures to solve the problems.

5.



Find the total cost. **\$18**

6.



How many marbles? **133**

## REVIEW

Multiply.

A23	1. 5 × 6 30	2. 6 × 6 36	3. 8 × 6 48	4. 6 × 7 42	5. 7 × 7 49	6. 7 × 8 56
A24	7. 3 × 8 24	8. 8 × 8 64	9. 5 × 8 40	10. 4 × 9 36	11. 9 × 7 63	12. 8 × 9 72
A25	13. 10 × 4 40	14. 7 × 10 70	15. 10 × 0 0	16. 8 × 10 80	17. 10 × 10 100	18. 10 × 1 10
A26	19. 5 × 6 30	20. 6 × 7 42	21. 7 × 8 56	22. 8 × 9 72	23. 9 × 7 63	24. 10 × 10 100

113

## Assigning the Practice

Minimum: 1-6

Average: 1-6

Enriched: 1-6

## Review Exercises

Questions	Objective	Pages
1-6	A23	104-105
7-12	A24	106-107
13-18	A25	108-109
19-24	A26	110-111

## Reinforcement

1. Write several picture problems on stiff cards and display them around the room for solving. Include problems requiring addition and subtraction as well as multiplication.

7 cones  
3 scoops for each cone  
How many scoops in all?

342 pages  
149 pages  
How many pages in all?

2. Have the students write some What's My Number? problems like the one below. These can be exchanged with a partner and solved.

When I multiply my number by 7, I get 63. When I multiply my number by 3, I get 27.

What's my number?

## Enrichment

Make a list of several basic multiplication, addition, and subtraction facts on the chalkboard. Ask the students to write a news story about each. Compile the stories in a classroom newspaper.

## Problem Solving Activities

Assign Level 4, Unit 4

## Extra Practice

## Worksheet PS 5

Pages 112-113

Solve.

- A toy company sells jig saw puzzles for \$3.00 each. How much does a set of 4 cost? **\$12.00**
- A box of crayons has 8 crayons in it. How many crayons are there in 7 boxes? **56**
- A toy company uses 2 m of rope to make a skipping rope. How much rope is needed to make 8 skipping ropes? **16 m**
- There are 8 posters in a series. If each poster costs \$3.00, how much does the whole series cost? **\$24.00**



Unit 5 Objective	Test Questions	Pages
A18	1-7	94-95
A19	8-12	96-97
A20	13-17	98-99
A21	18-22	100-101
A22	23-27	102-103
A23	28-32	104-105
A24	33-37	106-107
A25	38-42	108-109

# TEST

# UNIT 5

Draw an array.

1.  $3 \times 4 = 12$       2.  $6 \times 3 = 18$       3.  $8 \times 5 = 40$       4.  $7 \times 10 = 70$

Write two multiplication facts.

5.  $2 \times 5 = 10$   
 $5 \times 2 = 10$
6.  $3 \times 6 = 18$   
 $6 \times 3 = 18$
7.  $4 \times 5 = 20$   
 $5 \times 4 = 20$

Multiply.

8.  $\begin{array}{r} 3 \\ \times 2 \\ \hline 6 \end{array}$       9.  $\begin{array}{r} 2 \\ \times 2 \\ \hline 4 \end{array}$       10.  $\begin{array}{r} 4 \\ \times 2 \\ \hline 8 \end{array}$       11.  $\begin{array}{r} 3 \\ \times 3 \\ \hline 9 \end{array}$       12.  $\begin{array}{r} 5 \\ \times 3 \\ \hline 15 \end{array}$
13.  $\begin{array}{r} 8 \\ \times 4 \\ \hline 32 \end{array}$       14.  $\begin{array}{r} 4 \\ \times 4 \\ \hline 16 \end{array}$       15.  $\begin{array}{r} 6 \\ \times 4 \\ \hline 24 \end{array}$       16.  $\begin{array}{r} 9 \\ \times 5 \\ \hline 45 \end{array}$       17.  $\begin{array}{r} 5 \\ \times 5 \\ \hline 25 \end{array}$
18.  $\begin{array}{r} 6 \\ \times 0 \\ \hline 0 \end{array}$       19.  $\begin{array}{r} 0 \\ \times 8 \\ \hline 0 \end{array}$       20.  $\begin{array}{r} 0 \\ \times 0 \\ \hline 0 \end{array}$       21.  $\begin{array}{r} 1 \\ \times 5 \\ \hline 5 \end{array}$       22.  $\begin{array}{r} 7 \\ \times 1 \\ \hline 7 \end{array}$
23.  $\begin{array}{r} 4 \\ \times 7 \\ \hline 28 \end{array}$       24.  $\begin{array}{r} 0 \\ \times 1 \\ \hline 0 \end{array}$       25.  $\begin{array}{r} 3 \\ \times 5 \\ \hline 15 \end{array}$       26.  $\begin{array}{r} 1 \\ \times 4 \\ \hline 4 \end{array}$       27.  $\begin{array}{r} 5 \\ \times 6 \\ \hline 30 \end{array}$
28.  $\begin{array}{r} 7 \\ \times 6 \\ \hline 42 \end{array}$       29.  $\begin{array}{r} 6 \\ \times 6 \\ \hline 36 \end{array}$       30.  $\begin{array}{r} 8 \\ \times 6 \\ \hline 48 \end{array}$       31.  $\begin{array}{r} 2 \\ \times 7 \\ \hline 14 \end{array}$       32.  $\begin{array}{r} 7 \\ \times 9 \\ \hline 63 \end{array}$
33.  $\begin{array}{r} 2 \\ \times 9 \\ \hline 18 \end{array}$       34.  $\begin{array}{r} 8 \\ \times 8 \\ \hline 64 \end{array}$       35.  $\begin{array}{r} 7 \\ \times 8 \\ \hline 56 \end{array}$       36.  $\begin{array}{r} 3 \\ \times 9 \\ \hline 27 \end{array}$       37.  $\begin{array}{r} 9 \\ \times 9 \\ \hline 81 \end{array}$
38.  $\begin{array}{r} 4 \\ \times 10 \\ \hline 40 \end{array}$       39.  $\begin{array}{r} 6 \\ \times 10 \\ \hline 60 \end{array}$       40.  $\begin{array}{r} 10 \\ \times 10 \\ \hline 100 \end{array}$       41.  $\begin{array}{r} 8 \\ \times 10 \\ \hline 80 \end{array}$       42.  $\begin{array}{r} 10 \\ \times 5 \\ \hline 50 \end{array}$

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## Post-test

## Unit 5

Add or multiply.

1.  $3 + 3 = 6$       2.  $2 \times 3 = 6$       3.  $8 + 8 + 8 = 24$       4.  $3 \times 8 = 24$

Write two multiplication facts.

5.  $\begin{array}{c} \circ \circ \circ \circ \\ \circ \circ \circ \circ \\ \circ \circ \circ \circ \\ \circ \circ \circ \circ \\ \circ \circ \circ \circ \\ \circ \circ \circ \circ \\ \circ \circ \circ \circ \end{array}$   $7 \times 4 = 28$   
 $4 \times 7 = 28$
6.  $\begin{array}{c} \circ \circ \\ \circ \circ \\ \circ \circ \\ \circ \circ \\ \circ \circ \\ \circ \circ \\ \circ \circ \end{array}$   $8 \times 2 = 16$   
 $2 \times 8 = 16$
7.  $\begin{array}{c} \circ \circ \circ \circ \circ \\ \circ \circ \circ \circ \circ \\ \circ \circ \circ \circ \circ \\ \circ \circ \circ \circ \circ \\ \circ \circ \circ \circ \circ \\ \circ \circ \circ \circ \circ \\ \circ \circ \circ \circ \circ \\ \circ \circ \circ \circ \circ \end{array}$   $10 \times 5 = 50$   
 $5 \times 10 = 50$

Multiply.

8.  $\begin{array}{r} 7 \\ \times 3 \\ \hline 21 \end{array}$       9.  $\begin{array}{r} 2 \\ \times 4 \\ \hline 8 \end{array}$       10.  $\begin{array}{r} 3 \\ \times 3 \\ \hline 9 \end{array}$       11.  $\begin{array}{r} 8 \\ \times 2 \\ \hline 16 \end{array}$       12.  $\begin{array}{r} 6 \\ \times 3 \\ \hline 18 \end{array}$
13.  $\begin{array}{r} 4 \\ \times 8 \\ \hline 32 \end{array}$       14.  $\begin{array}{r} 6 \\ \times 5 \\ \hline 30 \end{array}$       15.  $\begin{array}{r} 4 \\ \times 4 \\ \hline 16 \end{array}$       16.  $\begin{array}{r} 5 \\ \times 9 \\ \hline 45 \end{array}$       17.  $\begin{array}{r} 8 \\ \times 5 \\ \hline 40 \end{array}$

## MEASUREMENT

Estimate each length.

- width of the Looking Back rectangle
- length of the same rectangle

Frame around page

15.3 cm

20.5 cm

Copy and complete the equations.

3.  $10 \text{ mm} = 1 \text{ cm}$

5. toothpick : 7 mm long

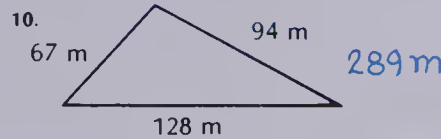
7. driveway : 22 m long

4.  $1000 \text{ m} = 1 \text{ km}$

6. dime : 1 mm thick

8. road : 22 km long

What is the perimeter?



Match the object with a mass.

11. 5 g

12. 200 g

13. 1 kg

nickel

toothpaste

Answer Box

toothpaste

nickel

dictionary

Write each amount using a dollar sign.

14. 16¢ \$0.16

15. 7¢ \$0.07

16. 40¢ \$0.40

Write each amount using a cent sign.

17. \$1.42

142¢

18. \$0.25

25¢

19. \$0.05

5¢

Add or subtract.

20.  $\begin{array}{r} \$7.14 \\ + 2.67 \\ \hline \$9.81 \end{array}$

21.  $\begin{array}{r} \$8.76 \\ + 8.49 \\ \hline \$17.25 \end{array}$

22.  $\begin{array}{r} \$6.82 \\ - 3.52 \\ \hline \$3.30 \end{array}$

23.  $\begin{array}{r} \$62.28 \\ - 40.55 \\ \hline \$21.73 \end{array}$

Count the change.

24. for \$1.02 from \$2.00 \$0.98

25. for \$3.17 from \$5.00 \$1.83

18. $\begin{array}{r} 0 \\ \times 6 \\ \hline 0 \end{array}$	19. $\begin{array}{r} 7 \\ \times 1 \\ \hline 7 \end{array}$	20. $\begin{array}{r} 0 \\ \times 0 \\ \hline 0 \end{array}$	21. $\begin{array}{r} 9 \\ \times 1 \\ \hline 9 \end{array}$	22. $\begin{array}{r} 0 \\ \times 4 \\ \hline 0 \end{array}$
23. $\begin{array}{r} 8 \\ \times 3 \\ \hline 24 \end{array}$	24. $\begin{array}{r} 2 \\ \times 9 \\ \hline 18 \end{array}$	25. $\begin{array}{r} 5 \\ \times 4 \\ \hline 20 \end{array}$	26. $\begin{array}{r} 3 \\ \times 7 \\ \hline 21 \end{array}$	27. $\begin{array}{r} 6 \\ \times 1 \\ \hline 6 \end{array}$
28. $\begin{array}{r} 6 \\ \times 6 \\ \hline 36 \end{array}$	29. $\begin{array}{r} 7 \\ \times 9 \\ \hline 63 \end{array}$	30. $\begin{array}{r} 8 \\ \times 6 \\ \hline 48 \end{array}$	31. $\begin{array}{r} 3 \\ \times 7 \\ \hline 21 \end{array}$	32. $\begin{array}{r} 7 \\ \times 8 \\ \hline 56 \end{array}$
33. $\begin{array}{r} 8 \\ \times 6 \\ \hline 48 \end{array}$	34. $\begin{array}{r} 9 \\ \times 9 \\ \hline 81 \end{array}$	35. $\begin{array}{r} 7 \\ \times 8 \\ \hline 56 \end{array}$	36. $\begin{array}{r} 9 \\ \times 6 \\ \hline 54 \end{array}$	37. $\begin{array}{r} 8 \\ \times 8 \\ \hline 64 \end{array}$
38. $\begin{array}{r} 2 \\ \times 10 \\ \hline 20 \end{array}$	39. $\begin{array}{r} 6 \\ \times 10 \\ \hline 60 \end{array}$	40. $\begin{array}{r} 10 \\ \times 7 \\ \hline 70 \end{array}$	41. $\begin{array}{r} 10 \\ \times 10 \\ \hline 100 \end{array}$	42. $\begin{array}{r} 10 \\ \times 0 \\ \hline 0 \end{array}$

# UNIT 6

## Division Facts

Theme: Special Days

Lesson		Objective	Pages
Preview		Review multiplication facts to $10 \times 10$ .	117
1	A27	Use related multiplication facts and arrays to develop division facts.	118-119
2	A28	Use 2 and 3 as divisors.	120-121
3	A29	Use 4 and 5 as divisors.	122-123
4	A30	Use 1 as a divisor and 0 as a dividend.	124-125
5	A31	Use the multiplication table to divide.	126-127
6	A32	Use 6 and 7 as divisors.	128-129
7	A33	Use 8 and 9 as divisors.	130-131
8	A34	Use 10 as a divisor.	132-133
9	A35	Use 1 to 10 as divisors.	134-135
10	PS6	Solve word problems involving division.	136-137
Test		Division Facts	138
Review		Multiplication Facts	139



# About This Unit

The purpose of this unit is:

1. to develop an understanding of the meaning of division and of its relationship to multiplication,
2. to develop facility with the basic division facts,
3. to apply division skills to problem situations.

The work of this unit is heavily dependent on the successful completion of the multiplication facts found in Unit 5. Each lesson develops division facts from previously learned multiplication facts. After the students solve division problems, they are often asked to write the related multiplication facts or to check their answers by multiplying.

The lessons of this unit are sequential and should be covered in the order given for maximum benefit. As the students work through the lessons, they should formulate rules which provide short cuts for certain division situations. For example, after working through lesson 4, the students should realize that:

- a. any number divided by one is that number;
- b. zero divided by any number is zero.

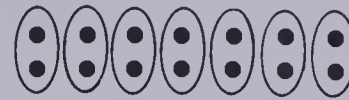
After lesson 9, students should see that when dividing a multiple of 10 by 10, one zero is removed (or the decimal point is moved one place to the left).

The lesson examples and problems in this unit demonstrate the two types of division questions, partition and measurement.

## partition

14 divided into groups of 2

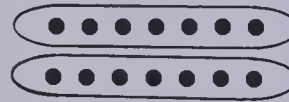
How many groups?



## measurement

14 divided into 2 groups

How many in each group?



Both types of question can be solved by the equation,  $14 \div 2 = 7$ .

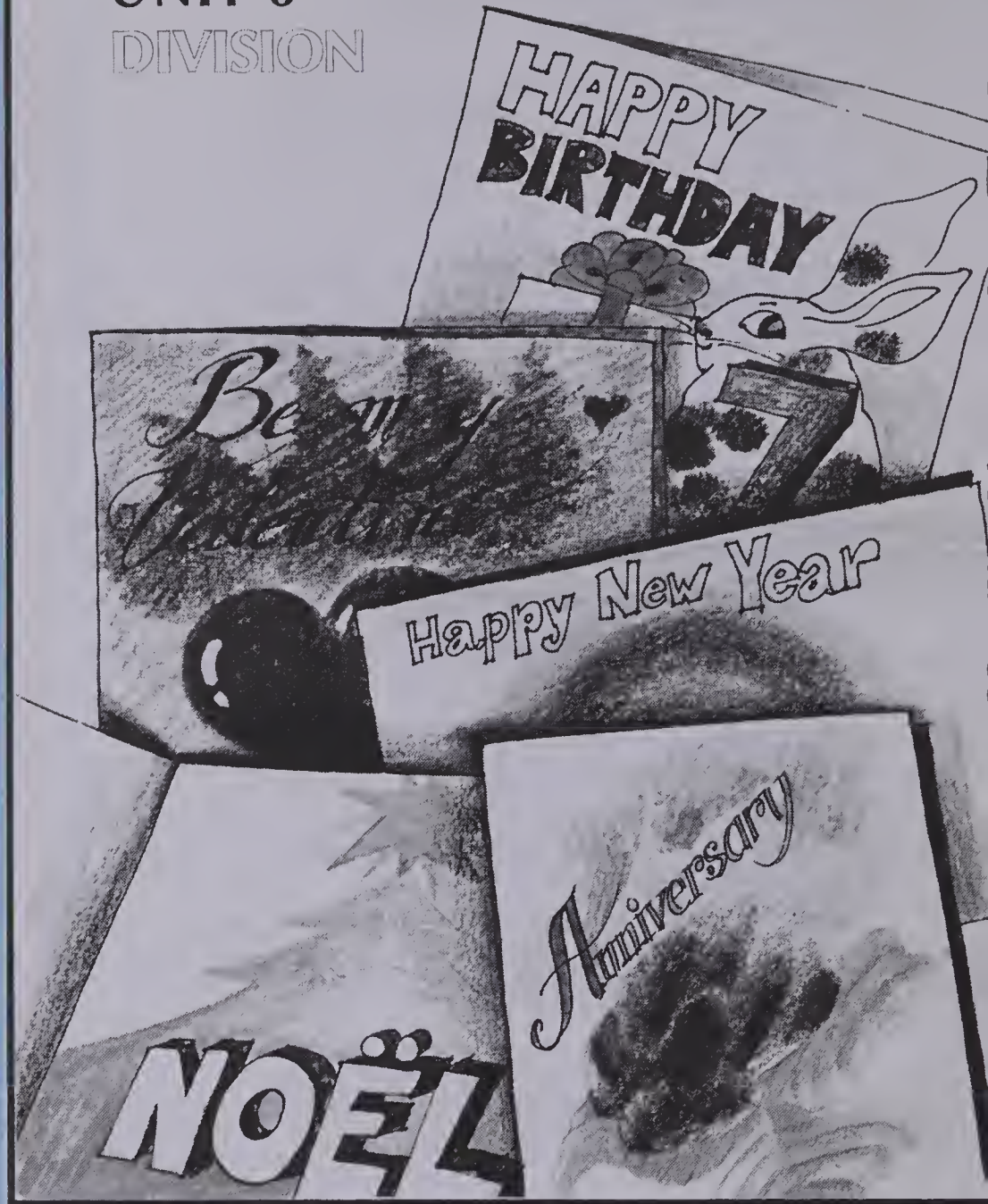
The teacher's guide encourages the use of concrete materials (such as flowers, play money, plastic glasses, cookies, etc.) to illustrate the lesson examples. It is important to provide these materials so that the students grasp the meaning of division more easily.

## Ideas

1. Display a 100 chart and/or a number line in the classroom to be used as a reference while the naming of multiples is reviewed.
2. Flash cards, Bingo games, and Concentration games which review basic multiplication and division facts should be used so that students are better prepared for future units of work.

# UNIT 6

## DIVISION



Unit 6 Objective	Test Questions	Pages
A27	1-5	118-119
A28	6-10	120-121
A29	11-15	122-123
A30	16-20	124-125
A31	6-20	126-127
A32	21-25	128-129
A33	26-30	130-131
A34	31-35	132-133
A35	21-35	134-135
PS	36-38	

### Pretest

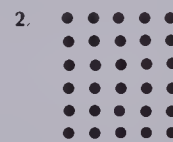
Unit 6

Write two division facts for each array.



$$48 \div 8 = 6$$

$$48 \div 6 = 8$$



$$30 \div 6 = 5$$

$$30 \div 5 = 6$$

Write a division fact.

3.  $6 \times 7 = 42$

$$42 \div 6 = 7$$

Divide.

6.  $\begin{array}{r} 6 \\ 2 \overline{)12} \end{array}$

7.  $\begin{array}{r} 4 \\ 3 \overline{)12} \end{array}$

4.  $5 \times 9 = 45$

$$45 \div 5 = 9$$

8.  $\begin{array}{r} 8 \\ 2 \overline{)16} \end{array}$

9.  $\begin{array}{r} 9 \\ 3 \overline{)27} \end{array}$

5.  $7 \times 7 = 49$

$$49 \div 7 = 7$$

10.  $\begin{array}{r} 10 \\ 2 \overline{)20} \end{array}$

11.  $\begin{array}{r} 9 \\ 5 \overline{)45} \end{array}$

12.  $\begin{array}{r} 4 \\ 4 \overline{)16} \end{array}$

13.  $\begin{array}{r} 1 \\ 5 \overline{)5} \end{array}$

14.  $\begin{array}{r} 7 \\ 4 \overline{)28} \end{array}$

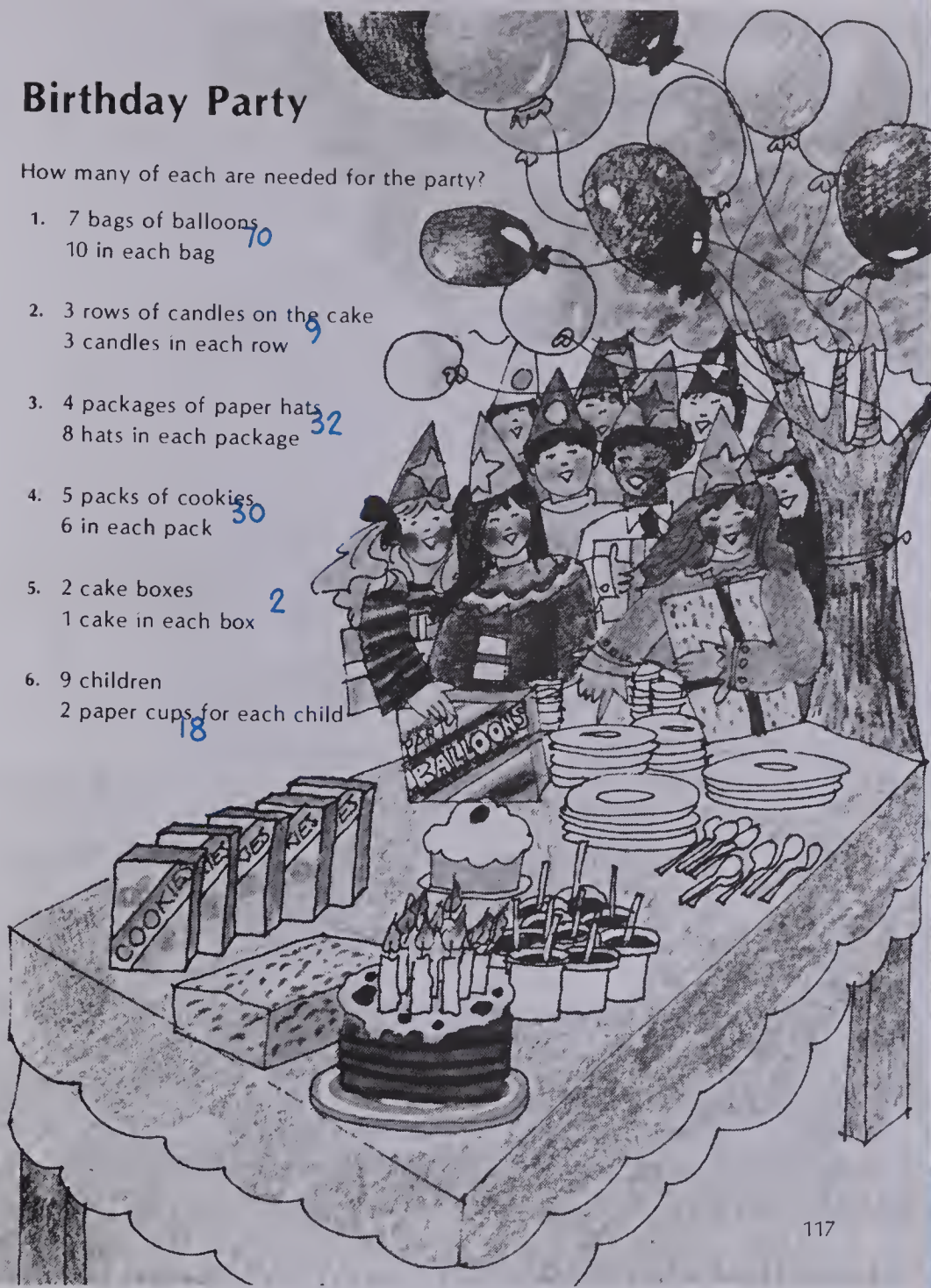
15.  $\begin{array}{r} 4 \\ 5 \overline{)20} \end{array}$



# Birthday Party

How many of each are needed for the party?

- 7 bags of balloons  
10 in each bag **70**
- 3 rows of candles on the cake  
3 candles in each row **9**
- 4 packages of paper hats  
8 hats in each package **32**
- 5 packs of cookies  
6 in each pack **30**
- 2 cake boxes  
1 cake in each box **2**
- 9 children  
2 paper cups for each child **18**



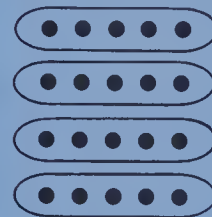
117

## UNIT 6

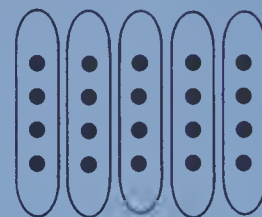
## PREVIEW

### Suggestions

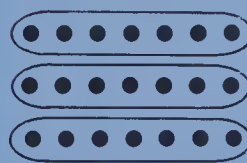
Display several arrays similar to the following and ask the students to think of the multiplication facts they illustrate.



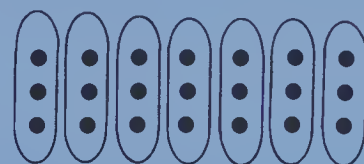
4 groups of 5  
 $4 \times 5 = 20$



5 groups of 4  
 $5 \times 4 = 20$



3 groups of 7  
 $3 \times 7 = 21$



7 groups of 3  
 $7 \times 3 = 21$

Write several multiplication facts on the chalkboard. Have a student draw an array to illustrate each one.

### About the Page

Talk about the illustration on page 116, pointing out some special days in the year. Have the students suggest other special days.

Explain that some birthday party items are listed on page 117, but the exact number of each is not given. Ask a student to draw a picture of the first problem on the chalkboard. Ask another student to think of the corresponding multiplication fact and to answer the question.

7 groups of 10  
 $7 \times 10 = 70$   
70 balloons

Encourage the students to answer the rest of the questions in a similar manner.

### Reinforcement

Provide a flash card drill of the basic multiplication facts. Have individuals, small groups, and the entire class say the answers aloud.

- |   |  |   |   |   |
|---|--|---|---|---|
| 16. $\begin{array}{r} 9 \\ 1 \overline{)9} \end{array}$   | 17. $\begin{array}{r} 0 \\ 5 \overline{)0} \end{array}$  | 18. $\begin{array}{r} 0 \\ 1 \overline{)0} \end{array}$     | 19. $\begin{array}{r} 0 \\ 4 \overline{)0} \end{array}$   | 20. $\begin{array}{r} 8 \\ 1 \overline{)8} \end{array}$   |
| 21. $\begin{array}{r} 6 \\ 7 \overline{)42} \end{array}$  | 22. $\begin{array}{r} 6 \\ 6 \overline{)36} \end{array}$ | 23. $\begin{array}{r} 8 \\ 7 \overline{)56} \end{array}$    | 24. $\begin{array}{r} 3 \\ 7 \overline{)21} \end{array}$  | 25. $\begin{array}{r} 8 \\ 6 \overline{)48} \end{array}$  |
| 26. $\begin{array}{r} 8 \\ 8 \overline{)64} \end{array}$  | 27. $\begin{array}{r} 9 \\ 9 \overline{)81} \end{array}$ | 28. $\begin{array}{r} 8 \\ 9 \overline{)72} \end{array}$    | 29. $\begin{array}{r} 5 \\ 8 \overline{)40} \end{array}$  | 30. $\begin{array}{r} 4 \\ 9 \overline{)36} \end{array}$  |
| 31. $\begin{array}{r} 4 \\ 10 \overline{)40} \end{array}$ | 32. $\begin{array}{r} 0 \\ 10 \overline{)0} \end{array}$ | 33. $\begin{array}{r} 10 \\ 10 \overline{)100} \end{array}$ | 34. $\begin{array}{r} 1 \\ 10 \overline{)10} \end{array}$ | 35. $\begin{array}{r} 7 \\ 10 \overline{)70} \end{array}$ |

Solve.

- An auditorium has 90 seats. There are 9 rows. How many seats are in each row? **10 seats**
- Jeanine laid eight rows of tile across the floor. There are nine tiles in each row. How many tiles did she lay in all? **72 tile**
- Nineteen sugar cookies and eight chocolate chip cookies were on a tray. Each of the Brant children ate 9 cookies. How many children do the Brants have? **3 children**



# UNIT 6 LESSON 1

## Objective A27

Use related multiplication facts and arrays to develop division facts.

## Introducing the Lesson

Review subtraction as the operation which is the *opposite* of addition.

★★★ and ★★ “How many in all?”

3 stars plus 2 stars = 5 stars in all

$$3 + 2 = 5$$

★★★✖★★ “How many left?”

5 stars minus 2 stars = 3 stars

$$5 - 2 = 3$$


Point out the two related addition and subtraction facts that make up the *fact family*.

$3 + 2 = 5$	$5 - 2 = 3$
$2 + 3 = 5$	$5 - 3 = 2$

Explain that multiplication and division have related facts that make up a fact family also.

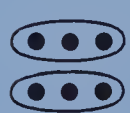
## Teaching the Lesson

Illustrate a multiplication fact with an array.



2 groups of 3  
 $2 \times 3 = 6$

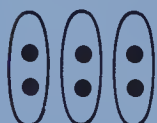
Now illustrate the *opposite* operation. Have the students suppose that there are 6 things *divided* into groups of 3. How many groups would there be?



6 divided into groups of 3  
 $6 \div 3 = 2$   
There are 2 groups.

Point out the related fact:  $2 \times 3 = 6$ .

Show how 6 things can also be divided into groups of 2. “How many groups of 2 would there be?” Draw an array.



6 divided into groups of 2  
 $6 \div 2 = 3$   
There are 3 groups.

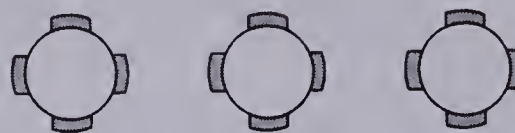
Ask the students to name all four members of this related fact family.

$2 \times 3 = 6$	$6 \div 3 = 2$
$3 \times 2 = 6$	$6 \div 2 = 3$

## The Meanings of Division

12 people for Thanksgiving  
4 at each dinner table  
How many tables?

12 people for Thanksgiving  
3 tables  
How many at each table?



$$3 \times 4 = 12$$

These problems can be solved by **division**.

$$12 \div 4 = 3$$

divisor

$$12 \div 3 = 4$$

divisor

There are 3 tables of 4 people.

## EXERCISES

Complete the division fact.

1.  $\begin{array}{ccc} * & * & * \\ * & * & * \end{array}$   
 $6 \div 3 = \square$   
2

2.  $\begin{array}{cccc} * & * & * & * \\ * & * & * & * \\ * & * & * & * \end{array}$   
 $12 \div 4 = \square$   
3

3.  $\begin{array}{cc} * & * \\ * & * \\ * & * \\ * & * \end{array}$   
 $8 \div 4 = \square$   
2

4.  $\begin{array}{cccccc} * & * & * & * & * & * \\ * & * & * & * & * & * \\ * & * & * & * & * & * \end{array}$   
 $18 \div 3 = \square$   
6

Draw an array.

5.  $9 \div 3 = 3$

6.  $8 \div 4 = 2$

7.  $6 \div 6 = 1$

8.  $10 \div 2 = 5$

Write a division fact.

9.  $3 \times 8 = 24$   
 $24 \div 3 = 8$

10.  $5 \times 3 = 15$   
 $15 \div 5 = 3$

11.  $4 \times 6 = 24$   
 $24 \div 4 = 6$

12.  $6 \times 6 = 36$   
 $36 \div 6 = 6$

Write a multiplication fact.

13.  $4 \div 2 = 2$   
 $2 \times 2 = 4$

14.  $25 \div 5 = 5$   
 $5 \times 5 = 25$

15.  $32 \div 4 = 8$   
 $8 \times 4 = 32$

16.  $49 \div 7 = 7$   
 $7 \times 7 = 49$

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## Using the Exercises

- For questions 1 to 4, help the students interpret the arrays to find the answers.
- To answer questions 5 to 8, students may draw arrays for either the *partitioning* or the *measuring* meaning of division.

a. partitioning: 8 divided into groups of 4



There are 2 groups.  $8 \div 4 = 2$

b. measuring: 8 divided into 4 groups



There are 2 in each group.  $8 \div 4 = 2$

- Questions 9 to 16 require the writing of related multiplication or division facts.

## PRACTICE

Write two division facts.

1.  $\begin{array}{c} * * \\ * * \\ * * \\ * * \end{array}$   
 $8 \div 4 = \blacksquare 2$   
 $8 \div 2 = \blacksquare 4$

2.  $\begin{array}{c} * * * * * \\ * * * * * \\ * * * * * \end{array}$   
 $18 \div 6 = 3$   
 $18 \div 3 = 6$

3.  $\begin{array}{c} * * * * \\ * * * * \\ * * * * \\ * * * * \\ * * * * \end{array}$   
 $24 \div 6 = 4$   
 $24 \div 4 = 6$

4.  $\begin{array}{c} * * * \\ * * * \\ * * * \\ * * * \\ * * * \end{array}$   
 $15 \div 5 = 3$   
 $15 \div 3 = 5$

Draw an array.

5.  $6 \div 2 = 3$  6.  $7 \div 7 = 1$  7.  $21 \div 3 = 7$  8.  $36 \div 9 = 4$

Write a division fact.

9.  $5 \times 6 = 30$   $30 \div 6 = 5$  10.  $6 \times 3 = 18$   $18 \div 6 = 3$  11.  $7 \times 10 = 70$   $70 \div 10 = 7$  12.  $8 \times 7 = 56$   $56 \div 8 = 7$

Write a multiplication fact.

13.  $16 \div 4 = 4$   $4 \times 4 = 16$  14.  $28 \div 7 = 4$   $7 \times 4 = 28$  15.  $35 \div 5 = 7$   $7 \times 5 = 35$  16.  $48 \div 6 = 8$   $6 \times 8 = 48$

17. A turkey dinner for 10 people costs \$50 to prepare.

Draw an array to show how much each person should pay.  $\$5$

18. Draw a picture to show how many turkeys are needed to have 20 drumsticks. 10

19. A restaurant ordered 72 dinner rolls from the bakery. The rolls were put in 8 bread baskets. Draw an array to show how many rolls were in each basket. 9

## BRAINTEASER

How can you cut a piece of string into 4 pieces with **one** cut?



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## Assigning the Practice

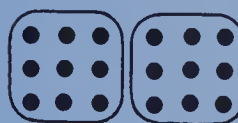
Minimum: 1-16

Average: 3-18

Enriched: 4-19

## Reinforcement

1. Prepare a set of work cards similar to the following. Ask the students to write the division fact that answers the question about the array.



18 divided into 2 groups.  
How many in each group?  
 $18 \div \blacksquare = \blacksquare$

18 divided into groups of 9.  
How many groups?  
 $18 \div \blacksquare = \blacksquare$

2. Ask the students to write all four members of the fact family for each of the following facts.

- a.  $9 \times 3 = 27$  b.  $16 \div 2 = 8$   
c.  $5 \times 8 = 40$  d.  $36 \div 4 = 9$   
e.  $7 \times 6 = 42$  f.  $20 \div 2 = 10$   
g.  $4 \times 7 = 28$  h.  $32 \div 8 = 4$

3. Use jumps on a number line to illustrate the relationship of multiplication and division.



3 jumps of 7  
How far?  
 $3 \times 7 = 21$



from 21, jumps of 7 each  
How many jumps?  
 $21 \div 7 = 3$

## Extra Practice

Write two division facts.

1.  $\begin{array}{c} \square \square \\ \square \square \\ \square \square \end{array}$   $6 \div 3 = 2$   $6 \div 2 = 3$   
2.  $\begin{array}{c} \square \square \square \square \\ \square \square \square \square \\ \square \square \square \square \end{array}$   $12 \div 4 = 3$   $12 \div 3 = 4$   
3.  $\begin{array}{c} \square \square \square \\ \square \square \square \\ \square \square \square \\ \square \square \square \end{array}$   $12 \div 6 = 2$   $12 \div 2 = 6$   
4.  $\begin{array}{c} \square \square \square \\ \square \square \square \\ \square \square \square \\ \square \square \square \\ \square \square \square \end{array}$   $15 \div 5 = 3$   $15 \div 3 = 5$

Draw an array.

5.  $6 \div 3 = 2$  6.  $24 \div 4 = 6$

Write a division fact.

7.  $5 \times 2 = 10$   $10 \div 5 = 2$  8.  $6 \times 7 = 42$   $42 \div 6 = 7$

Write a multiplication fact.

9.  $15 \div 5 = 3$   $5 \times 3 = 15$  10.  $35 \div 7 = 5$   $5 \times 7 = 35$

## Worksheet A27

Pages 118-119

## Enrichment

Assign *Brainteaser* at the bottom of page 119. Provide scissors and string so the students can test their solutions.

# UNIT 6 LESSON 2

## Objective A28

Use 2 and 3 as divisors.

### Introducing the Lesson

Review counting by twos and threes. Ask individual students, small groups of students, and the entire class to count aloud. Follow this with a flash card drill of the multiplication facts with 2 or 3 as factors.

### Teaching the Lesson

Read and discuss the first problem at the top of page 120. Use two students and play money to illustrate the situation. Give out the money, one dollar bill at a time to the two students until \$12.00 has been distributed. "How much money did each receive?" *Six dollars.* Write the corresponding division on the chalkboard in two ways.

12 divided into 2 groups  $\frac{6}{2 \overline{)12}}$   
 $12 \div 2 = 6$  or  
 There are 6 in each group.

Talk about checking the quotient by multiplying.

2 groups of 6 = 12  
 $2 \times 6 = 12$

With sets of classroom objects (pencils, books, etc.), illustrate the dividing of these sets by 2. Then have a student write the corresponding division fact in two ways and check the quotient by multiplying.

Read and discuss the second problem on page 120. Illustrate the situation with a cardboard circle cut into fifteen equal pieces. Ask a student to group three pieces at a time until all the pieces are used. "How many groups are there?" or "How many children can have three pieces?" *Five.*

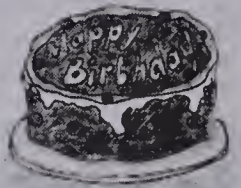
Write the corresponding division on the chalkboard in two ways.

15 divided into groups of 3  $\frac{5}{3 \overline{)15}}$   
 $15 \div 3 = 5$  or  
 There are 5 groups.

Talk about checking the quotient by multiplying.

5 groups of 3 = 15  
 $5 \times 3 = 15$

## 2 and 3 as Divisors



Bill and Betty are twins

On their birthday they received \$12 from their grandparents.

How much money should each child receive?

To find how much money each child receives, divide.

$$12 \div 2 = 6 \quad \text{or} \quad \frac{6}{2 \overline{)12}}$$

Each child receives \$6

Think:  
 $2 \times 6 = 12$   
 or  
 $6 \times 2 = 12$

The birthday cake was cut into 15 pieces

Each child at the party ate 3 pieces. All the cake was eaten.

How many children were at the party?

$$15 \div 3 = 5 \quad \text{or} \quad \frac{5}{3 \overline{)15}}$$

There were 5 children at the party

Think:  
 $5 \times 3 = 15$

### EXERCISES

Copy and complete

1.  $3 \times 2 = 6$       2.  $4 \times 2 = 8$       3.  $\blacksquare \times 2 = 10$       4.  $\blacksquare \times 2 = 2$
- $6 \div 2 = \blacksquare$        $8 \div 2 = \blacksquare$        $10 \div 2 = \blacksquare$        $2 \div 2 = \blacksquare$
- $3$  $4$  $5$  $1$

Divide

5.  $12 \div 2$   $\frac{6}{2 \overline{)12}}$       6.  $14 \div 2$   $\frac{7}{2 \overline{)14}}$       7.  $16 \div 2$   $\frac{8}{2 \overline{)16}}$       8.  $18 \div 2$   $\frac{9}{2 \overline{)18}}$
9.  $2 \overline{)6}$       10.  $2 \overline{)18}$       11.  $2 \overline{)10}$       12.  $2 \overline{)4}$

Copy and complete

13.  $2 \times 3 = 6$       14.  $3 \times 3 = 9$       15.  $\blacksquare \times 3 = 12$       16.  $\blacksquare \times 3 = 3$
- $6 \div 3 = \blacksquare$        $9 \div 3 = \blacksquare$        $12 \div 3 = \blacksquare$        $3 \div 3 = \blacksquare$
- $2$  $3$  $4$  $1$

Divide

17.  $15 \div 3$   $\frac{5}{3 \overline{)15}}$       18.  $18 \div 3$   $\frac{6}{3 \overline{)18}}$       19.  $21 \div 3$   $\frac{7}{3 \overline{)21}}$       20.  $24 \div 3$   $\frac{8}{3 \overline{)24}}$
21.  $3 \overline{)24}$       22.  $3 \overline{)27}$       23.  $3 \overline{)30}$       24.  $3 \overline{)3}$

120

### Using the Exercises

- Questions 1 to 4 and 13 to 16 involve the inverse relationship of multiplication and division. Since division is checked by multiplication, this is an important relationship for students to understand.
- Questions 5 to 12 and 17 to 24 require an understanding of the two ways division can be written.



## PRACTICE

Divide. Check by multiplying.

1.  $2 \overline{)18}$       2.  $2 \overline{)6}$       3.  $2 \overline{)16}$       4.  $2 \overline{)12}$       5.  $2 \overline{)10}$
6.  $3 \overline{)6}$       7.  $3 \overline{)12}$       8.  $3 \overline{)18}$       9.  $3 \overline{)27}$       10.  $3 \overline{)15}$
11.  $3 \overline{)24}$       12.  $2 \overline{)18}$       13.  $3 \overline{)21}$       14.  $2 \overline{)14}$       15.  $3 \overline{)3}$

16. Write the top row of the multiplication table for 2s

×	1	3	5	4	9	10	6	8	7	2
2	2	6	10	8	18	20	12	16	14	4

17. Write the top row of the multiplication table for 3s.

×	1	10	3	6	5	9	2	7	4	8
3	3	30	9	18	15	27	6	21	12	24

Solve.

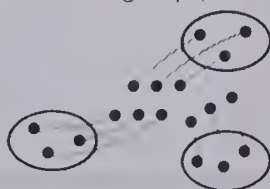
18. René and Colette received a package of 18 balloons. How many balloons should each child receive? **9**
19. Each child at a party got 3 candies. If the whole bag of 24 candies was emptied, how many children were at the party? **8**

## USING THE CALCULATOR

John had to separate a large collection of coins into small piles.

Show how John could use his calculator to determine the number of groups, if:

1. 54 coins were put in groups of 9 coins each **6**
2. 30 coins were put in groups of 6 coins each **5**
3. 72 coins were put in groups of 8 coins each **9**
4. 56 coins were put in groups of 7 coins each **8**
5. 36 coins were put in groups of 4 coins each **9**



121

## Assigning the Practice

Minimum: 1-17

Average: 1-19

Enriched: 1-19

## Reinforcement

1. Assign *Using the Calculator* at the bottom of page 121.

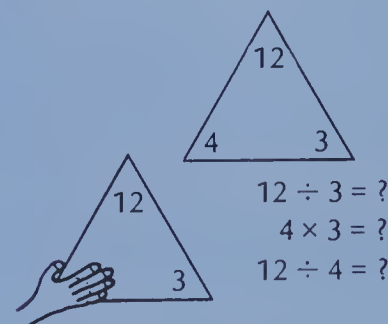
2. Have the students complete the following.

÷ 2		÷ 3	
in	out	in	out
12		3	
4		21	
16		15	
8		18	
6		27	
20		9	
18		30	

3. Ask the students to count by twos to 20. Ask them to write a division fact with a divisor of 2 and a related multiplication fact for each.

2	$2 \div 2 = 1$	$1 \times 2 = 2$
4	$4 \div 2 = 2$	$2 \times 2 = 4$
6		

4. Make triangular flash cards. Place the numerals for a division fact in each corner. Hold the corner of the triangle, covering up one numeral. Ask the students to say the missing numeral and to write the corresponding multiplication or division fact.



$$12 \div 3 = ?$$

$$4 \times 3 = ?$$

$$12 \div 4 = ?$$

## Extra Practice

Divide. Check by multiplying.

1.  $2 \overline{)6}$       2.  $2 \overline{)12}$       3.  $2 \overline{)10}$       4.  $2 \overline{)18}$
5.  $3 \overline{)9}$       6.  $3 \overline{)12}$       7.  $3 \overline{)18}$       8.  $3 \overline{)24}$
9.  $2 \overline{)14}$       10.  $3 \overline{)15}$       11.  $2 \overline{)16}$       12.  $3 \overline{)27}$
13.  $18 \div 3 = \underline{6}$       14.  $14 \div 2 = \underline{7}$       15.  $21 \div 3 = \underline{7}$       16.  $2 \div 2 = \underline{1}$

Solve.

17. At a birthday party, 16 hot dogs were eaten. If each child ate 2 hot dogs, how many children were at the party? **8**

## Worksheet A28

Pages 120-121

## Enrichment

Have the students play a game using a set of cards with the even numbers from 22 to 40. Each player draws a card and divides the number by 2.

A similar game can be played with cards labelled with the multiples of 3 from 33 to 66. Players must divide by 3.

# UNIT 6 LESSON 3

## Objective A29

Use 4 and 5 as divisors.

### Introducing the Lesson

Review counting by fours and fives. Write multiplication tables for 4 and for 5 on the chalkboard and ask the students to use skip counting to complete them.

×	1	2	3	4	5	6	7	8	9	10
4										

Provide a flash card drill of the multiplication facts that have 4 or 5 as a factor.

### Teaching the Lesson

Read and discuss the first problem at the top of page 122. Use Christmas cards to illustrate the dividing situation. Write the corresponding division on the chalkboard in two ways.

$$\begin{array}{l} 20 \text{ divided into 4 groups} \\ 20 \div 4 = 5 \quad \text{or} \quad 4 \overline{)20} \\ \text{There are 5 in each group.} \end{array}$$

Have a student show how the quotient can be checked by multiplying.

$$\begin{array}{l} 4 \text{ groups of } 5 = 20 \\ 4 \times 5 = 20 \end{array}$$

Devise several other dividing situations with 4 as a divisor and illustrate them with sets of Christmas cards. Ask the students to write a division fact for each. Have them check their answers by multiplying.

Talk about the second problem on page 122. Illustrate the situation with plastic glasses. Ask a student to arrange the glasses into groups of 5 each. "How many groups of 5 are there in 50?" *Ten*. Write the corresponding division on the chalkboard in two ways.

$$\begin{array}{l} 50 \text{ divided into groups of 5} \\ 50 \div 5 = 10 \quad \text{or} \quad 5 \overline{)50} \\ \text{There are 10 groups.} \end{array}$$

Have a student check the quotient by writing the related multiplication.

Illustrate other division facts having 5 as a divisor and the related multiplication facts with the plastic glasses.

## 4 and 5 as Divisors

Mrs. Klaus bought a box of 20 Christmas cards for her 4 children. If they shared them equally, how many cards did each child get?

$$20 \div 4 = 5 \quad \text{because } 4 \times 5 = 20 \quad 4 \overline{)20}^5$$

Each child got 5 cards

Mr. Klaus held a Christmas party for his children and their friends. He served 50 glasses of pop at the party. One large bottle of pop fills 5 glasses. How many large bottles were used?

$$50 \div 5 = 10 \quad \text{because } 10 \times 5 = 50 \quad 5 \overline{)50}^{10}$$

Mr. Klaus used 10 large bottles.

### EXERCISES

Copy and complete.

- $1 \times 4 = 4$      $4 \div 4 = 1$
- $2 \times 4 = 8$      $8 \div 4 = 2$
- $\blacksquare \times 4 = 12$      $12 \div 4 = 3$
- $\blacksquare \times 4 = 16$      $16 \div 4 = 4$

Divide.

- $20 \div 4 = 5$
- $24 \div 4 = 6$
- $4 \overline{)28}^7$
- $4 \overline{)32}^8$
- $4 \overline{)36}^9$

Copy and complete.

- $1 \times 5 = 5$      $5 \div 5 = 1$
- $2 \times 5 = 10$      $10 \div 5 = 2$
- $\blacksquare \times 5 = 15$      $15 \div 5 = 3$
- $\blacksquare \times 5 = 20$      $20 \div 5 = 4$

Divide.

- $25 \div 5 = 5$
- $30 \div 5 = 6$
- $5 \overline{)35}^7$
- $5 \overline{)40}^8$
- $5 \overline{)45}^9$

122

### Using the Exercises

- Questions 1 to 4 and 10 to 13 show the relationship of multiplication and division.
- Questions 5 to 9 and 14 to 18 are division facts written horizontally or vertically. Make sure the students place the quotient over the correct numeral in the dividend in vertical examples.

$$5 \overline{)35}^7$$

## PRACTICE

Divide. Check by multiplying.

1.  $4 \overline{)12}$   $\overset{3}{}$
2.  $4 \overline{)32}$   $\overset{8}{}$
3.  $4 \overline{)20}$   $\overset{5}{}$
4.  $4 \overline{)40}$   $\overset{10}{}$
5.  $4 \overline{)24}$   $\overset{6}{}$
6.  $5 \overline{)10}$   $\overset{2}{}$
7.  $5 \overline{)15}$   $\overset{3}{}$
8.  $5 \overline{)30}$   $\overset{6}{}$
9.  $5 \overline{)45}$   $\overset{9}{}$
10.  $5 \overline{)40}$   $\overset{8}{}$
11.  $5 \overline{)35}$   $\overset{7}{}$
12.  $4 \overline{)28}$   $\overset{7}{}$
13.  $5 \overline{)50}$   $\overset{10}{}$
14.  $4 \overline{)4}$   $\overset{1}{}$
15.  $4 \overline{)36}$   $\overset{9}{}$

16. Write the top row of the multiplication chart for 4s.

×	1	3	2	9	5	10	7	8	6	4
4	4	12	8	36	20	40	28	32	24	16

17. Write the top row of the multiplication chart for 5s.

×	2	1	3	7	5	6	4	10	9	8
5	10	5	15	35	25	30	20	50	45	40

Solve

18. Terry made booklets for Christmas gifts. She copied and illustrated 12 poems. She put 4 poems in each booklet. How many booklets did she make?  $\underline{3}$
19. Grandmother Klaus sent \$5 to each of her grandchildren as a Christmas gift. She spent \$45 on these gifts. How many grandchildren received the gift?  $\underline{9}$
20. How many dollar bills should you receive for 36 quarters?  $\underline{9}$

## Dazed and Weak

Donna just washed her bike. She does this chore every 5 days. How many times does she wash it in 5 weeks?  $\underline{7}$



123

## Assigning the Practice

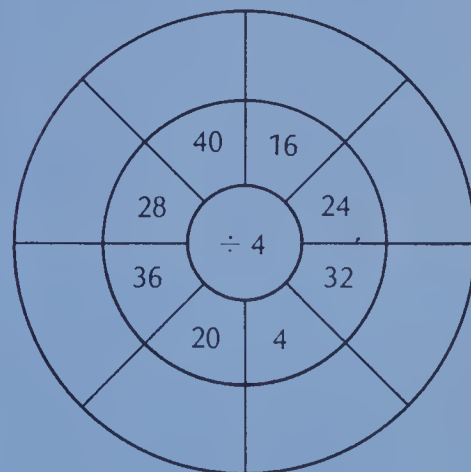
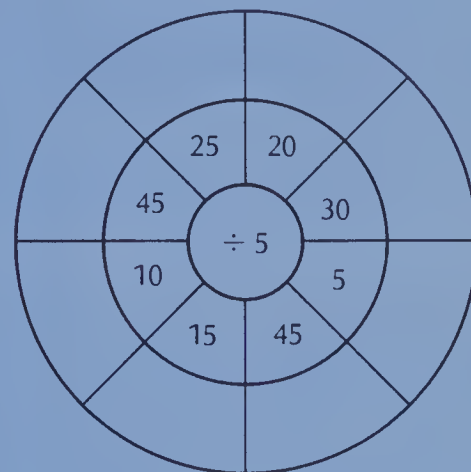
Minimum: 1-18

Average: 1-18

Enriched: 6-20

## Reinforcement

1. Assign *Dazed and Weak* at the bottom of page 123.
2. Have the students complete the following charts.



## Extra Practice

Divide. Check by multiplying.

1.  $4 \overline{)4}$   $\overset{1}{}$
2.  $4 \overline{)16}$   $\overset{4}{}$
3.  $4 \overline{)28}$   $\overset{7}{}$
4.  $4 \overline{)32}$   $\overset{8}{}$
5.  $5 \overline{)15}$   $\overset{3}{}$
6.  $5 \overline{)25}$   $\overset{5}{}$
7.  $5 \overline{)30}$   $\overset{6}{}$
8.  $5 \overline{)45}$   $\overset{9}{}$
9.  $4 \overline{)20}$   $\overset{5}{}$
10.  $5 \overline{)35}$   $\overset{7}{}$
11.  $4 \overline{)36}$   $\overset{9}{}$
12.  $5 \overline{)20}$   $\overset{4}{}$
13.  $24 \div 4 = \underline{6}$
14.  $50 \div 5 = \underline{10}$
15.  $8 \div 4 = \underline{2}$
16.  $40 \div 5 = \underline{8}$

Solve.

17. The fourth grade class collected 45 cans of food for baskets for the poor at Christmas time. They put 9 cans in each basket. How many baskets did they fill?  $\underline{5}$

## Worksheet A29

Pages 122-123

3. Ask the students to supply the missing factor and to write a corresponding division fact.

- a.  $6 \times \blacksquare = 24$
- b.  $\blacksquare \times 5 = 25$
- c.  $5 \times \blacksquare = 30$
- d.  $4 \times \blacksquare = 32$
- e.  $4 \times \blacksquare = 4$
- f.  $9 \times \blacksquare = 45$
- g.  $7 \times \blacksquare = 28$
- h.  $\blacksquare \times 1 = 5$

## Enrichment

Have the students complete the following number patterns.

- a. 24, 28, 32,  $\blacksquare$ ,  $\blacksquare$ ,  $\blacksquare$ ,  $\blacksquare$
- b. 45, 40, 35,  $\blacksquare$ ,  $\blacksquare$ ,  $\blacksquare$ ,  $\blacksquare$
- c. 300, 350, 400,  $\blacksquare$ ,  $\blacksquare$ ,  $\blacksquare$ ,  $\blacksquare$
- d. 1200, 1600, 2000,  $\blacksquare$ ,  $\blacksquare$ ,  $\blacksquare$ ,  $\blacksquare$
- e. 850, 900, 950,  $\blacksquare$ ,  $\blacksquare$ ,  $\blacksquare$ ,  $\blacksquare$
- f. 360, 320, 280,  $\blacksquare$ ,  $\blacksquare$ ,  $\blacksquare$ ,  $\blacksquare$



# UNIT 6 LESSON 4

## Objective A30

Use 1 as a divisor and 0 as a dividend.

### Introducing the Lesson

Ask the students, "If 5 books were shared by 5 students, how many books would each student get?" *One.*

$$5 \div 5 = 1 \quad \text{or} \quad \begin{array}{r} 1 \\ 5 \overline{)5} \end{array}$$

Talk about what happens when a number is divided by itself. Record other examples on the chalkboard.

$$\begin{array}{ll} 4 \div 4 = 1 & 8 \div 8 = 1 \\ 2 \div 2 = 1 & 11 \div 11 = 1 \end{array}$$

Let the students conclude that *when- ever a number is divided by itself, the quotient is 1.*

### Teaching the Lesson

Read, discuss, and act out the dividing-by-one situation at the top of page 124. Talk about other dividing-by-one situations and write corresponding division facts on the chalkboard. After several facts have been recorded, see if the students can determine on their own that *whenever a number is divided by 1, the quotient is the number itself.*

Point out the second problem situation on page 124. Have four students come to the front of the room. Show what happens when you have *no* candy and you want to give each of them something. "When I have nothing, how much do each of you get?" *Nothing.* Write the division on the chalkboard.

$$0 \div 4 = 0 \quad \text{or} \quad \begin{array}{r} 0 \\ 4 \overline{)0} \end{array}$$

Ask individual students to come to the chalkboard and write the division for these examples in two ways.

- nothing divided by 9
- nothing divided by 15
- nothing divided by 28
- nothing divided by 52

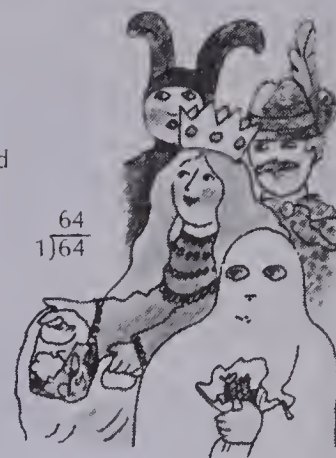
Let the students conclude that *when- ever zero is divided by a number, the quotient is zero.* (At this time it is not necessary to point out that dividing by zero is indeterminate.)

## 1 and 0 in Division

Mr. Love bought 64 bags of candy for Halloween. He gave away all the candy, one bag to every child. How many children received a bag of candy?

$$64 \div 1 = 64 \quad \text{because } 64 \times 1 = 64 \quad \begin{array}{r} 64 \\ 1 \overline{)64} \end{array}$$

64 children received a bag of candy.



Ms. Spence didn't buy any candies for Halloween. Her 4 grandchildren came to the door.

If the children shared equally, how many candies did each one get?

$$0 \div 4 = 0 \quad \text{because } 4 \times 0 = 0 \quad \begin{array}{r} 0 \\ 4 \overline{)0} \end{array}$$

Each child received 0 candies.

### EXERCISES

Copy and complete

- $3 \times 1 = 3$      $3 \div 1 = \blacksquare$
- $6 \times 1 = 6$      $6 \div 1 = \blacksquare$
- $\blacksquare \times 1 = 8$      $8 \div 1 = \blacksquare$
- $\blacksquare \times 1 = 9$      $9 \div 1 = \blacksquare$

Divide.

- $4 \div 1$
- $10 \div 1$
- $1 \overline{)7}$
- $1 \overline{)8}$
- $1 \overline{)9}$

Copy and complete

- $0 \times 2 = 0$      $0 \div 2 = \blacksquare$
- $0 \times 5 = 0$      $0 \div 5 = \blacksquare$
- $\blacksquare \times 7 = 0$      $0 \div 7 = \blacksquare$
- $\blacksquare \times 8 = 0$      $0 \div 8 = \blacksquare$

Divide

- $0 \div 3$
- $0 \div 1$
- $7 \overline{)0}$
- $8 \overline{)0}$
- $9 \overline{)0}$

### Using the Exercises

- Questions 1 to 4 and 10 to 13 involve the inverse relationship of multiplication and division.
- Questions 5 to 9 and 14 to 18 require the student to divide by 1 or to divide 0 by a number.

## PRACTICE

Divide. Check by multiplying.

1.  $1 \overline{)3}$       2.  $1 \overline{)4}$       3.  $1 \overline{)5}$       4.  $1 \overline{)9}$       5.  $1 \overline{)6}$
6.  $3 \overline{)0}$       7.  $5 \overline{)0}$       8.  $6 \overline{)0}$       9.  $8 \overline{)0}$       10.  $9 \overline{)0}$
11.  $1 \overline{)7}$       12.  $7 \overline{)0}$       13.  $1 \overline{)8}$       14.  $10 \overline{)0}$       15.  $0 \overline{)0}$

Solve.

16. As a Halloween special, Betty's father received a bag of 12 candy bars free. What did each candy bar cost him? **\$0**
17. Prizes worth \$25 were to be given to the winners of a Halloween contest. There was only 1 winner. How much did that person receive? **\$25**

## Analogies

Copy and complete each analogy.  
Make some of your own.

becomes as becomes

	→		as		→	
	→		as		→	
	→		as		→	
	→		as		→	

125

## Assigning the Practice

Minimum: 1-17

Average: 1-17

Enriched: 1-17

## Reinforcement

1. Have the students complete the following table.

÷	1	0	4	2
12				
28				
36				
4				
40				

2. Ask the students to choose the correct comparison sign (<, =, or >) to make a true statement.

- a.  $4 \div 4 \bullet 0 \div 4$
- b.  $5 \div 5 \bullet 5 \div 1$
- c.  $4 \div 2 \bullet 2 \div 1$
- d.  $0 \div 1 \bullet 1 \div 1$
- e.  $5 - 5 \bullet 0 \div 5$
- f.  $0 + 0 \bullet 1 \div 1$
- g.  $3 + 3 \bullet 3 \div 3$
- h.  $4 \div 4 \bullet 5 \div 5$
- i.  $0 \div 2 \bullet 2 \div 2$

## Enrichment

1. Assign *Analogies* at the bottom of page 125.

2. Ask the students to complete these statements. Remind them to work inside the parentheses first.

- a.  $14 - (1 \div 1) = \blacksquare$
- b.  $29 + (0 \div 2) = \blacksquare$
- c.  $35 - (4 \div 4) = \blacksquare$
- d.  $51 - (6 \div 2) = \blacksquare$
- e.  $85 + (5 \div 1) = \blacksquare$

## Extra Practice

Divide. Check by multiplying.

1.  $1 \overline{)3}$       2.  $1 \overline{)4}$       3.  $1 \overline{)7}$       4.  $1 \overline{)10}$
  5.  $2 \overline{)0}$       6.  $5 \overline{)0}$       7.  $8 \overline{)0}$       8.  $9 \overline{)0}$
  9.  $1 \overline{)1}$       10.  $1 \overline{)0}$       11.  $1 \overline{)9}$       12.  $10 \overline{)0}$
13.  $12 \div 1 = 12$     14.  $0 \div 14 = 0$     15.  $25 \div 1 = 25$     16.  $0 \div 22 = 0$

Write a division fact. Solve.

17. 0 kg of chocolate  
14 children to share it  
How much for each child?

$$0 \div 14 = 0$$

- 0 balloons  
32 children to share them  
How many for each child?

$$0 \div 32 = 0$$

## Worksheet A30

Pages 124-125

UNIT 6

LESSON 5

Objective A31

Use the multiplication table to divide.

Introducing the Lesson

Display a blank multiplication table on the chalkboard or overhead projector. Have the students count by ones, twos, threes, and so on, as you fill in the table.

Teaching the Lesson

Tell the students that you are going to use the multiplication table to show them a short cut for dividing. Show them how to divide 21 by 3 on the table.

Ask the students to use the table on page 126 as you give them several division facts to solve. Have them name a related multiplication fact for each division fact.

Let the students work in pairs, taking turns, with one student giving a division problem and the other student using the multiplication table to answer it.

Using a Multiplication Table to Divide

Can you find the answer for  $24 \div 4$  by using the multiplication table?

Find 4 in the column under the times sign.

Follow that row until you come to 24.

Follow that column until you get to the top.

The answer is 6.

x	0	1	2	3	4	5	6	7	8	9	10
0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10
2	0	2	4	6	8	10	12	14	16	18	20
3	0	3	6	9	12	15	18	21	24	27	30
4	0	4	8	12	16	20	24	28	32	36	40
5	0	5	10	15	20	25	30	35	40	45	50
6	0	6	12	18	24	30					
7	0	7	14	21	28	35					
8	0	8	16	24	32	40					
9	0	9	18	27	36	45					
10	0	10	20	30	40	50					

Can you find the answer another way?

EXERCISES

Divide. Use the multiplication table.

1.  $3 \div 3$

5.  $16 \div 4$

9.  $2 \overline{)14}$

13.  $5 \overline{)30}$
2.  $6 \div 3$

6.  $20 \div 4$

10.  $2 \overline{)16}$

14.  $5 \overline{)35}$
3.  $9 \div 3$

7.  $24 \div 4$

11.  $2 \overline{)18}$

15.  $5 \overline{)40}$
4.  $12 \div 3$

8.  $28 \div 4$

12.  $2 \overline{)20}$

16.  $5 \overline{)45}$

Using the Exercises

- Questions 1 to 16 provide practice solving horizontal and vertical division problems using the multiplication table. Students who would rather not use the table should be encouraged to do so.



## PRACTICE

Divide. Use the multiplication table.

1.  $5 \overline{)30}$       2.  $4 \overline{)12}$       3.  $3 \overline{)27}$       4.  $2 \overline{)14}$       5.  $1 \overline{)9}$
6.  $4 \overline{)40}$       7.  $2 \overline{)12}$       8.  $5 \overline{)25}$       9.  $3 \overline{)24}$       10.  $0 \overline{)0}$
11.  $2 \overline{)10}$       12.  $3 \overline{)21}$       13.  $1 \overline{)8}$       14.  $5 \overline{)15}$       15.  $4 \overline{)32}$
16.  $5 \overline{)5}$       17.  $3 \overline{)30}$       18.  $2 \overline{)2}$       19.  $4 \overline{)36}$       20.  $1 \overline{)7}$

Solve.

21. Four straws were given to each child at a party for a game. In all, 32 straws were given out. How many children were playing the game? **8**
22. The girls changed their shoes to play in the gym. They left 18 shoes and 3 sweaters in the locker room. How many girls were playing in the gym? **9**

## REVIEW

- Divide.
- |     |                        |                        |                        |                        |                        |
|-----|------------------------|------------------------|------------------------|------------------------|------------------------|
| A28 | 1. $2 \overline{)2}$   | 2. $2 \overline{)8}$   | 3. $2 \overline{)12}$  | 4. $2 \overline{)6}$   | 5. $2 \overline{)18}$  |
|     | 6. $3 \overline{)15}$  | 7. $3 \overline{)27}$  | 8. $3 \overline{)30}$  | 9. $3 \overline{)24}$  | 10. $3 \overline{)12}$ |
| A29 | 11. $4 \overline{)12}$ | 12. $4 \overline{)32}$ | 13. $4 \overline{)28}$ | 14. $4 \overline{)36}$ | 15. $4 \overline{)8}$  |
|     | 16. $5 \overline{)30}$ | 17. $5 \overline{)40}$ | 18. $5 \overline{)15}$ | 19. $5 \overline{)35}$ | 20. $5 \overline{)45}$ |
| A30 | 21. $1 \overline{)4}$  | 22. $1 \overline{)1}$  | 23. $1 \overline{)5}$  | 24. $1 \overline{)9}$  | 25. $1 \overline{)7}$  |
|     | 26. $9 \overline{)0}$  | 27. $8 \overline{)0}$  | 28. $2 \overline{)0}$  | 29. $1 \overline{)0}$  | 30. $0 \overline{)0}$  |
| A31 | 31. $1 \overline{)10}$ | 32. $2 \overline{)20}$ | 33. $3 \overline{)18}$ | 34. $4 \overline{)4}$  | 35. $5 \overline{)50}$ |
|     | 36. $3 \overline{)21}$ | 37. $5 \overline{)25}$ | 38. $4 \overline{)16}$ | 39. $2 \overline{)14}$ | 40. $3 \overline{)6}$  |

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## Assigning the Practice

Minimum: 1-22

Average: 1-22

Enriched: 1-22

## Review Exercises

Questions	Objective	Pages
1-10	A28	120-121
11-20	A29	122-123
21-30	A30	124-125
31-40	A31	126-127

## Reinforcement

1. Have the students play a game using the numbers in the multiplication table. A player begins by choosing a number. The next player divides it and gives the result. The third player divides that answer and gives the result, and so on. The person left with an answer of 1 is eliminated from the game. A new number is chosen and the game continues. (Note: Rule out division by 1.)

2. Ask the students to look at the table and make lists of numbers divisible by 2, 3, or 4. Have them determine:

- a. which numbers are divisible by 2 and 4?
- b. which numbers are divisible by 3 and 4?
- c. which numbers are divisible by 2 and 3?
- d. which numbers are divisible by 2, 3, and 4?

## Enrichment

Have the students list addition, subtraction, multiplication, and division examples in which the answer is 2, 3, or 4. Display their findings.

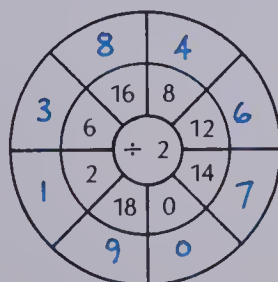
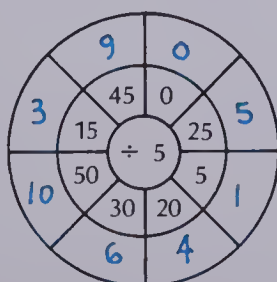
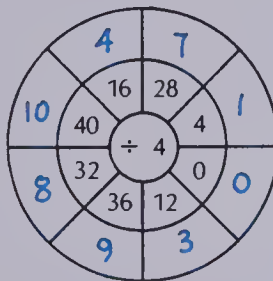
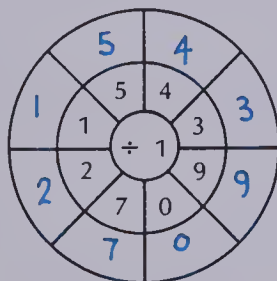
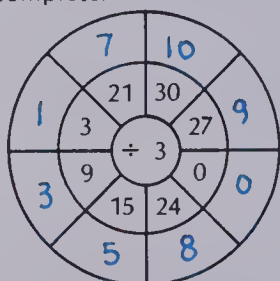
2
$5 - 3$
$16 \div 8$
$1 + 1$
$2 \times 1$

3

4

## Extra Practice

Complete.



## Worksheet A31

Pages 126-127

# UNIT 6 LESSON 6

## Objective A32

Use 6 and 7 as divisors.

### Introducing the Lesson

Review counting forward by sixes and sevens. Use a 100 chart or a number line to help the students get started. Have a few students count back by sixes from 60 to 6 or by sevens from 70 to 7.

Provide a flash card drill of the multiplication facts that have 6 or 7 as a factor.

### Teaching the Lesson

Talk about the first problem at the top of page 128. Illustrate the situation with artificial flowers and play money. Ask a student to separate the bills into equal groups for each flower. "How much does each flower cost?" *Two dollars*. Have someone record the division in two ways on the chalkboard and write the related multiplication fact which checks the answer.

$$\begin{array}{l} 12 \text{ divided into 6 groups} \\ 12 \div 6 = 2 \quad \text{or} \quad 6 \overline{)12} \\ \text{There are 2 in each group.} \\ 6 \text{ groups of } 2 = 12 \\ 6 \times 2 = 12 \end{array}$$

Illustrate other division facts with 6 as a divisor using sets of flowers.

Read and discuss the second problem on page 128.

$$\begin{array}{l} 28 \text{ divided into 7 groups} \\ 28 \div 7 = 4 \quad \text{or} \quad 7 \overline{)28} \\ \text{There are 4 in each group.} \end{array}$$

Devise similar problems for the other division facts that have 7 as a divisor. Include, "If Mario did *no* errands in 7 weeks, how many errands did he do each week?"

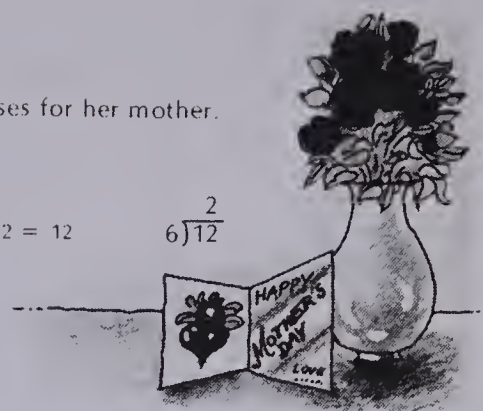
$$0 \div 7 = 0 \quad \text{or} \quad 7 \overline{)0}$$

## 6 and 7 as Divisors

On Mother's day, Carla bought 6 red roses for her mother. She paid \$12 altogether. How much did each rose cost?

$$12 \div 6 = 2 \quad \text{because } 6 \times 2 = 12 \quad 6 \overline{)12}$$

Each rose cost \$2.



Mario promised to do errands for his mother without being coaxed. In the next 7 weeks he did 28 errands. About how many errands did Mario do each week?

$$28 \div 7 = 4 \quad \text{because } 7 \times 4 = 28 \quad 7 \overline{)28}$$

Mario did about 4 errands each week.

### EXERCISES

Copy and complete.

$$\begin{array}{llll} 1. & 3 \times 6 = 18 & 2. & 6 \times 6 = 36 \\ 18 \div 6 = 3 & & 36 \div 6 = 6 & \end{array}$$

Divide

$$\begin{array}{lllll} 5. & 6 \overline{)36} & 6. & 6 \overline{)42} & 7. & 6 \overline{)48} \end{array}$$

Copy and complete

$$\begin{array}{llll} 10. & 2 \times 7 = 14 & 11. & 6 \times 7 = 42 \\ 14 \div 7 = 2 & & 42 \div 7 = 6 & \end{array}$$

Divide

$$\begin{array}{lllll} 14. & 7 \overline{)42} & 15. & 7 \overline{)49} & 16. & 7 \overline{)56} \end{array}$$

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### Using the Exercises

- Questions 1 to 4 and 10 to 13 reinforce the relationship of multiplication and division.
- Questions 5 to 9 and 14 to 18 provide practice with division facts that have 6 or 7 as a divisor. Encourage checking by multiplying.

## PRACTICE

Divide. Check by multiplying.

1.  $6 \overline{)18}$       2.  $6 \overline{)36}$       3.  $6 \overline{)48}$       4.  $6 \overline{)60}$       5.  $6 \overline{)54}$
6.  $7 \overline{)7}$       7.  $7 \overline{)21}$       8.  $7 \overline{)42}$       9.  $7 \overline{)63}$       10.  $7 \overline{)49}$
11.  $6 \overline{)42}$       12.  $7 \overline{)35}$       13.  $6 \overline{)30}$       14.  $7 \overline{)56}$       15.  $7 \overline{)70}$

16. Write the top row of the multiplication chart for 6s.

×	1	2	3	4	5	6	7	8	9	10
6	6	12	18	24	30	36	42	48	54	60

17. Write the top row of the multiplication chart for 7s.

×	1	2	3	4	5	6	7	8	9	10
7	7	14	21	28	35	42	49	56	63	70

Solve

18. Lily-Rose Florists sold \$56 worth of flowers at \$7 a bunch on Mother's Day. How many bunches did they sell? **8**
19. Six stems of daisies had 30 flowers. About how many flowers were there on each stem? **5**

## On Tour

"The Meanies" are a new rock group. They played in all the cities in the chart and had one night off between cities. How many weeks were they on tour? **4**



### Schedule

Whitehorse	1 night
Vancouver	3 nights
Calgary	4 nights
Winnipeg	2 nights
Toronto	3 nights
Montreal	3 nights
Halifax	3 nights
St. John's	2 nights

129

## Assigning the Practice

Minimum: 1-18

Average: 1-18

Enriched: 1-19

## Reinforcement

1. Ask the students to count by sixes to 60 and write out the corresponding multiplication and division fact family for each.

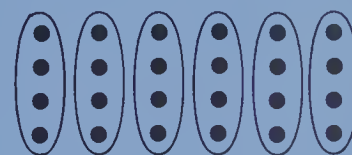
6	$6 \times 1 = 6$	$1 \times 6 = 6$	$6 \div 1 = 6$	$6 \div 6 = 1$
12				
18				

Do the same for 7, 14, 21, ..., 70.

2. Have the students complete the following number patterns.

- a. 6, 12, 18, ■, ■, ■, ■
- b. 28, 35, 42, ■, ■, ■, ■
- c. 24, 30, 36, ■, ■, ■, ■
- d. 54, 48, 42, ■, ■, ■, ■
- e. 56, 49, 42, ■, ■, ■, ■
- f. 70, 140, 210, ■, ■, ■, ■

3. Ask the students to make arrays illustrating the division facts with 6 or 7 as a divisor.

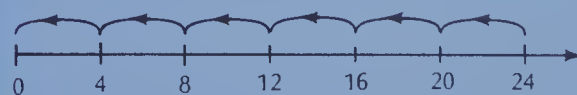


$$24 \div 6 = 4$$

## Enrichment

1. Assign *On Tour* at the bottom of page 129.

2. Ask the students to illustrate the division facts that have 6 or 7 as a divisor with jumps on a number line.



24 divided into 6 jumps.

$$24 \div 6 = 4$$

There are 4 in each jump.

## Extra Practice

Divide. Check by multiplying.

1.  $6 \overline{)6}$       2.  $6 \overline{)24}$       3.  $6 \overline{)36}$       4.  $6 \overline{)48}$
5.  $7 \overline{)7}$       6.  $7 \overline{)28}$       7.  $7 \overline{)42}$       8.  $7 \overline{)63}$
9.  $6 \overline{)54}$       10.  $7 \overline{)56}$       11.  $6 \overline{)60}$       12.  $7 \overline{)49}$
13.  $35 \div 7 = 5$       14.  $6 \div 1 = 6$       15.  $0 \div 7 = 0$       16.  $42 \div 6 = 7$

Solve.

17. In the average home about 14 hours a week are used for preparing food. How many hours a day is this? **2h**

## Worksheet A32

Pages 128-129



# UNIT 6 LESSON 7

## Objective A33

Use 8 and 9 as divisors.

## Introducing the Lesson

Play the game Buzz to review counting by 8 and 9. Students count by ones around the room and say *Buzz* when a multiple of 8 (or 9) comes up.

Make a list of the multiples of 9 on the chalkboard. Point out how the sum of the digits of each multiple is 9.

## Teaching the Lesson

Read and discuss the first problem at the top of page 130. Illustrate the situation in the text with cookies and have the students record the division fact in two ways. Encourage them to check the answer by multiplying.

32 divided into 8 groups  $\frac{4}{8 \overline{)32}}$   
 $32 \div 8 = 4$  or  
 There are 4 in each group.  
 8 groups of 4 = 32  
 $8 \times 4 = 32$

Have at least 80 cookies available to illustrate and record the rest of the division facts with 8 as a divisor.

Talk about the second problem on page 130. Use cards or cookies to illustrate other dividing-by-nine situations.

## 8 and 9 as Divisors

Vicky invited 8 children to her Valentine's party. Her mother bought 32 special Valentine cookies for the party. The cookies were shared equally. How many cookies did each child get?

$$32 \div 8 = 4 \quad \text{because } 8 \times 4 = 32 \quad \frac{4}{8 \overline{)32}}$$

Each child got 4 cookies.



Hugh had 45 valentines which he sorted into 9 equal piles. How many valentines were in each pile?

$$45 \div 9 = 5 \quad \text{because } 9 \times 5 = 45 \quad \frac{5}{9 \overline{)45}}$$

There were 5 in each pile.

### EXERCISES

Copy and complete.

1.  $2 \times 8 = 16$     2.  $6 \times 8 = 48$     3.  $\blacksquare \times 8 = 56$     4.  $\blacksquare \times 8 = 64$   
 $16 \div 8 = \blacksquare$      $48 \div 8 = \blacksquare$      $56 \div 8 = \blacksquare$      $64 \div 8 = \blacksquare$   
                     2                      6                      7                      8

Divide.

5.  $8 \overline{)48}$     6.  $8 \overline{)56}$     7.  $8 \overline{)64}$     8.  $8 \overline{)72}$     9.  $8 \overline{)80}$

Copy and complete.

10.  $3 \times 9 = 27$     11.  $6 \times 9 = 54$     12.  $\blacksquare \times 9 = 63$     13.  $\blacksquare \times 9 = 72$   
 $27 \div 9 = \blacksquare$      $54 \div 9 = \blacksquare$      $63 \div 9 = \blacksquare$      $72 \div 9 = \blacksquare$   
                     3                      6                      7                      8

Divide.

14.  $9 \overline{)54}$     15.  $9 \overline{)63}$     16.  $9 \overline{)72}$     17.  $9 \overline{)81}$     18.  $9 \overline{)9}$

## Using the Exercises

- Continue to emphasize the inverse relationship of multiplication and division as the students answer questions 1 to 4 and 10 to 13.
- Questions 5 to 9 and 14 to 18 provide practice in dividing by 8 and by 9. Make sure that the students align the quotient properly above the dividend.

$$\frac{6}{9 \overline{)54}}$$

## PRACTICE

Divide. Check by multiplying.

1.  $8 \overline{)24}$   $\overset{3}{}$
2.  $8 \overline{)40}$   $\overset{5}{}$
3.  $8 \overline{)64}$   $\overset{8}{}$
4.  $8 \overline{)80}$   $\overset{10}{}$
5.  $8 \overline{)72}$   $\overset{9}{}$
6.  $9 \overline{)9}$   $\overset{1}{}$
7.  $9 \overline{)45}$   $\overset{5}{}$
8.  $9 \overline{)63}$   $\overset{7}{}$
9.  $9 \overline{)90}$   $\overset{10}{}$
10.  $9 \overline{)54}$   $\overset{6}{}$
11.  $8 \overline{)56}$   $\overset{7}{}$
12.  $9 \overline{)72}$   $\overset{8}{}$
13.  $8 \overline{)48}$   $\overset{6}{}$
14.  $9 \overline{)81}$   $\overset{9}{}$
15.  $8 \overline{)8}$   $\overset{1}{}$

16. Write the top row of the multiplication chart for 8s.

x	1	3	2	4	9	8	7	5	6	10
8	8	24	16	32	72	64	56	40	48	80

17. Write the top row of the multiplication chart for 9s.

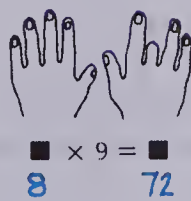
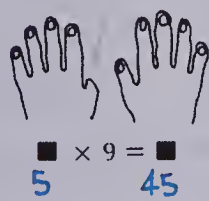
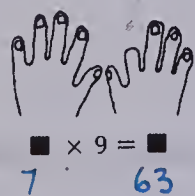
x	2	1	3	9	5	8	7	10	6	4
9	18	9	27	81	45	72	63	90	54	36

Solve.

18. There are 8 people in Teresa's family. For Valentine's Day, they sent 64 cards. If everyone sent the same number of cards, how many did each person send? **8**
19. A candy company packs chocolate-covered Brazil nuts in bags of 9. How many bags are needed to pack 72 nuts? **8**

## Finger Tricks

Describe how  shows  $4 \times 9 = 36$



131

## Extra Practice

Divide. Check by multiplying.

1.  $8 \overline{)8}$   $\overset{1}{}$
2.  $8 \overline{)24}$   $\overset{3}{}$
3.  $8 \overline{)64}$   $\overset{8}{}$
4.  $8 \overline{)72}$   $\overset{9}{}$
5.  $9 \overline{)9}$   $\overset{1}{}$
6.  $9 \overline{)36}$   $\overset{4}{}$
7.  $9 \overline{)54}$   $\overset{6}{}$
8.  $9 \overline{)18}$   $\overset{2}{}$
9.  $8 \overline{)48}$   $\overset{6}{}$
10.  $9 \overline{)63}$   $\overset{7}{}$
11.  $8 \overline{)56}$   $\overset{7}{}$
12.  $9 \overline{)81}$   $\overset{9}{}$
13.  $27 \div 9 = \underline{3}$
14.  $8 \div 1 = \underline{8}$
15.  $0 \div 9 = \underline{0}$
16.  $40 \div 8 = \underline{5}$

Solve.

17. Jane helps as a Candy Striper at the hospital. In 8 Saturdays she worked 32 hours. About how many hours did she work each Saturday? **4h**

## Worksheet A33

Pages 130-131

## Assigning the Practice

Minimum: 1-18

Average: 1-18

Enriched: 6-19

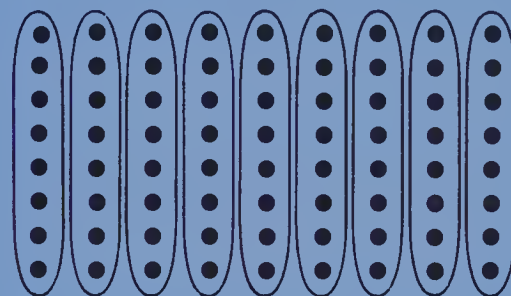
## Reinforcement

1. Make a set of cards with the following numbers.

36	42	48	54
60	49	56	63
70	64	72	50
81	90		

Ask each student to draw a card and name two numbers which are divisors of the number on the card.

2. Ask the students to make arrays illustrating the division facts with 8 or 9 as a divisor.



$$72 \div 9 = 8$$

3. Ask the students to use the signs  $<$ ,  $=$ , or  $>$  to complete the following statements.

- a.  $45 \div 9 \bullet 56 \div 7$
- b.  $18 \div 3 \bullet 1 \times 6$
- c.  $0 \div 8 \bullet 8 \div 8$
- d.  $42 \div 7 \bullet 63 \div 9$
- e.  $40 \div 5 \bullet 64 \div 8$
- f.  $9 \div 9 \bullet 9 \div 1$
- g.  $90 \div 9 \bullet 10 \div 1$
- h.  $18 \div 2 \bullet 9 \div 1$

## Enrichment

1. Assign *Finger Tricks* at the bottom of page 131. Show how this method can be used for dividing by 9 also.

2. Have the students find the missing numerals. Remind them to work inside the parentheses first.

- a.  $24 + (\blacksquare \div 9) = 25$
- b.  $16 - (45 \div \blacksquare) = 7$
- c.  $32 + (\blacksquare \div 8) = 35$

# UNIT 6 LESSON 8

## Objective A34

Use 10 as a divisor.

### Introducing the Lesson

Review the multiplication facts with 10 as a factor. List the facts on the chalkboard after the students have named them, and let the students note the pattern. Ask them to devise a rule for multiplying by 10.

### Teaching the Lesson

Read and discuss the problem situation at the top of page 132. To illustrate the situation, place 80 beans on the overhead projector. Ask a student to separate them into groups of 10 each. "How many groups of 10 are there?" *Eight*. Ask a student to record the situation on the chalkboard in two ways and to check the quotient by multiplying.

$$80 \text{ divided into groups of } 10 \quad \begin{array}{r} 8 \\ 10 \overline{)80} \end{array}$$

$$80 \div 10 = 8 \quad \text{or} \quad 10 \overline{)80}$$

There are 8 groups.

$$8 \text{ groups of } 10 = 80$$

$$8 \times 10 = 80$$

Illustrate several other dividing-by-ten examples with beans on the overhead projector. After the division facts have been recorded on the chalkboard, ask the students if they notice a pattern. Let them discover a rule for dividing by 10.

Each student should have a turn manipulating the beans on the overhead. Alternatively, the students should have beans at their desks so they can manipulate them themselves to illustrate dividing by 10.

## 10 as a Divisor

Brown School had a picnic. The principal brought along 80 prizes. He gave 10 to each class for their games and races. How many classes were at the picnic?

$$80 \div 10 = 8 \quad \text{because } 8 \times 10 = 80 \quad \begin{array}{r} 8 \\ 10 \overline{)80} \end{array}$$

There were 8 classes at the picnic.



### EXERCISES

Copy and complete.

1.  $2 \times 10 = 20$     2.  $5 \times 10 = 50$     3.  $\square \times 10 = 70$     4.  $\square \times 10 = 90$
- $20 \div 10 = \square$      $50 \div 10 = \square$      $70 \div 10 = \square$      $90 \div 10 = \square$
- 2 5 7 9

Divide.

5.  $10 \overline{)10}$     6.  $10 \overline{)40}$     7.  $10 \overline{)60}$     8.  $10 \overline{)70}$
9.  $10 \overline{)20}$     10.  $10 \overline{)50}$     11.  $10 \overline{)90}$     12.  $10 \overline{)100}$

132

### Using the Exercises

- Questions 1 to 4 require the students to supply the missing number as they apply the inverse relationship of multiplication and division.
- Questions 5 to 12 involve dividing by 10. Check that the students align the quotients above the dividends correctly.

$$\begin{array}{r} 10 \\ 10 \overline{)100} \end{array}$$



## PRACTICE

Divide. Check by multiplying.

1.  $10 \overline{)30}$   $\overset{3}{}$
2.  $10 \overline{)40}$   $\overset{4}{}$
3.  $10 \overline{)70}$   $\overset{7}{}$
4.  $10 \overline{)0}$   $\overset{0}{}$
5.  $10 \overline{)50}$   $\overset{5}{}$
6.  $10 \overline{)20}$   $\overset{2}{}$
7.  $10 \overline{)10}$   $\overset{1}{}$
8.  $10 \overline{)80}$   $\overset{8}{}$
9.  $10 \overline{)100}$   $\overset{10}{}$
10.  $10 \overline{)90}$   $\overset{9}{}$
11.  $9 \overline{)63}$   $\overset{7}{}$
12.  $8 \overline{)56}$   $\overset{7}{}$
13.  $9 \overline{)72}$   $\overset{8}{}$
14.  $7 \overline{)49}$   $\overset{7}{}$
15.  $6 \overline{)54}$   $\overset{9}{}$

16. Write the top row of the multiplication chart for 10s.

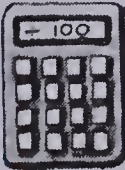
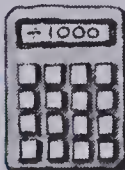
x	0	1	2	3	4	5	6	7	8	9	10
10	0	10	20	30	40	50	60	70	80	90	100

Solve.

17. In the 10 cases of mixed soda pop there were 100 bottles of orange. About how many orange were in each case? **10**
18. Tim picked up 40 interesting stones along the beach. He sorted them into 10 equal piles. How many were in each pile? **4**
19. Two teams had a tug of war. 20 children joined in. If the teams were equal, how many children were on each team? **10**

## USING THE CALCULATOR

Use a calculator to do several problems. Look for a pattern. Then do as many problems as you can without using the machine. Use the calculator to check your answers.

3 000	<b>30</b>		3 000	<b>3</b>	
25 000	<b>250</b>		25 000	<b>25</b>	
618 000	<b>6180</b>		618 000	<b>618</b>	
9 000	<b>90</b>		9 000	<b>9</b>	
327 000	<b>3270</b>		327 000	<b>327</b>	
49 000	What's the rule?		49 000	What's the rule?	
<b>490</b>	<b>take off 2 zeros</b>		<b>49</b>	<b>take off 3 zeros</b>	

133

## Assigning the Practice

Minimum: 1-18

Average: 1-18

Enriched: 6-19

## Reinforcement

1. Play a Number Toss game. The two players need a pair of markers and a game board as shown below. Players, in turn, toss a marker onto the game board, divide the number landed on by 10, and say the answer. When correct, the answer is entered on the score sheet. After three turns, the player with the highest score wins.

70	
50	90
30	
100	20
80	
60	40
0	10

2. Ask the students to count by tens to 100 and then write two related division facts for each count.

10	$10 \div 10 = 1$	$10 \div 1 = 10$
20	$20 \div 10 = 2$	$20 \div 2 = 10$
30	$30 \div 10 = 3$	$30 \div 3 = 10$

## Enrichment

1. Assign *Using the Calculator* at the bottom of page 133.

2. Ask the students to complete this table.

$\div 10$	
in	out
5000	
500	
50	
5	

## Extra Practice

Count by tens.

1. 10, 20, 30, 40, 50, 60, 70, 80, 90, 100.
2. 100, 90, 80, 70, 60, 50, 40, 30, 20, 10.

Divide. Check by multiplying.

3.  $10 \overline{)10}$   $\overset{1}{}$
4.  $10 \overline{)30}$   $\overset{3}{}$
5.  $50 \div 10 = \underline{5}$
6.  $20 \div 10 = \underline{2}$
7.  $10 \overline{)90}$   $\overset{9}{}$
8.  $10 \overline{)60}$   $\overset{6}{}$
9.  $0 \div 10 = \underline{0}$
10.  $80 \div 10 = \underline{8}$
11.  $10 \overline{)40}$   $\overset{4}{}$
12.  $10 \overline{)70}$   $\overset{7}{}$

Solve.

13. The audience at the spring concert sat in rows of 10. There were 100 people at the concert. How many rows were filled? **10**

## Worksheet A34

Pages 132-133

# UNIT 6 LESSON 9

## Objective A35

Use 1 to 10 as divisors.

### Introducing the Lesson

Display a blank multiplication table on the chalkboard or overhead projector. Ask the students to count by ones, twos, threes, and so on as you fill in the table.

### Teaching the Lesson

Review the procedure for dividing with a multiplication table as explained in Lesson 5, page 126. Ask the students to use the table on page 134 as you give them several division facts to solve in this way.

Let the students discover that most dividends (or products) are written twice on the table. Ask the students to write four related division and multiplication facts for 63, 72, 54, 36, and 48 using the table.

$63 \div 9 = 7$	$7 \times 9 = 63$
$63 \div 7 = 9$	$9 \times 7 = 63$

Have the students note the numbers on a diagonal from the upper left-hand corner to the lower right-hand corner of the table: 1, 4, 9, 16, 25, 36, 49, 64, 81, and 100. Ask them to make a multiplication and division fact family with these numbers as dividends or products. How many related facts can be written for the numbers on the diagonal?

$1 \div 1 = 1$	$1 \times 1 = 1$
$4 \div 2 = 2$	$2 \times 2 = 4$

## Using a Multiplication Table to Divide

You have learned all the division facts you will ever need to know. All these facts can be found on the multiplication table.

Do you know the answer to  $72 \div 8$ ?  
Check by finding it on the table.

$\times$	0	1	2	3	4	5	6	7	8	9	10
0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10
2	0	2	4	6	8	10	12	14	16	18	20
3	0	3	6	9	12	15	18	21	24	27	30
4	0	4	8	12	16	20	24	28	32	36	40
5	0	5	10	15	20	25	30	35	40	45	50
6	0	6	12	18	24	30	36	42	48	54	60
7	0	7	14	21	28	35	42	49	56	63	70
8	0	8	16	24	32	40	48	56	64	72	80
9	0	9	18	27	36	45	54	63	72	81	90
10	0	10	20	30	40	50	60	70	80	90	100

### EXERCISES

Divide. Use the multiplication table to check.

- $18 \div 6 = 3$
- $24 \div 6 = 4$
- $30 \div 6 = 5$
- $36 \div 6 = 6$
- $36 \div 9 = 4$
- $45 \div 9 = 5$
- $54 \div 9 = 6$
- $63 \div 9 = 7$
- $7 \overline{)21} = 3$
- $7 \overline{)28} = 4$
- $7 \overline{)35} = 5$
- $7 \overline{)42} = 6$
- $8 \overline{)56} = 7$
- $8 \overline{)64} = 8$
- $8 \overline{)72} = 9$
- $8 \overline{)80} = 10$

### Using the Exercises

- Questions 1 to 16 provide practice with horizontal and vertical division using the multiplication table. Students who would rather not use the table should be encouraged to do so.

## PRACTICE

Divide. Use the multiplication table to check.

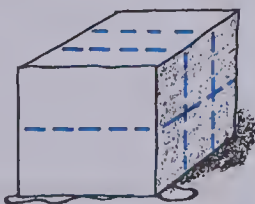
1.  $6 \overline{)6}$
2.  $6 \overline{)30}$
3.  $6 \overline{)42}$
4.  $6 \overline{)54}$
5.  $6 \overline{)60}$
6.  $7 \overline{)21}$
7.  $7 \overline{)35}$
8.  $7 \overline{)42}$
9.  $7 \overline{)49}$
10.  $7 \overline{)56}$
11.  $8 \overline{)16}$
12.  $8 \overline{)32}$
13.  $8 \overline{)48}$
14.  $8 \overline{)72}$
15.  $8 \overline{)80}$
16.  $9 \overline{)0}$
17.  $9 \overline{)18}$
18.  $9 \overline{)36}$
19.  $9 \overline{)54}$
20.  $9 \overline{)81}$
21.  $10 \overline{)10}$
22.  $10 \overline{)20}$
23.  $10 \overline{)40}$
24.  $10 \overline{)60}$
25.  $10 \overline{)90}$
26.  $6 \overline{)18}$
27.  $7 \overline{)28}$
28.  $8 \overline{)24}$
29.  $9 \overline{)27}$
30.  $10 \overline{)30}$
31.  $8 \overline{)64}$
32.  $6 \overline{)48}$
33.  $10 \overline{)100}$
34.  $9 \overline{)72}$
35.  $5 \overline{)45}$

Solve.

36. The principal of Rainbow School bought 10 new books for each classroom. He bought 90 books in all. How many classrooms were there? **9**
37. The total cost of \$81 for new records was shared by 9 classrooms. How much did each classroom have to pay? **\$9**
38. The Parents' Club donated \$54 for new sports equipment. Six classrooms shared it equally. How much did each classroom get? **\$9**

## Cut That Out

How can you cut a cube-shaped package of ice cream into 6 equal pieces with only 3 straight cuts with a knife?



135

## Assigning the Practice

Minimum: odd numbers

Average: even numbers

Enriched: 21-38

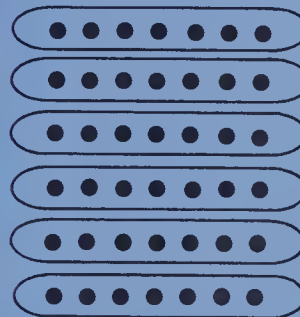
## Reinforcement

1. Ask the students to cut up a multiplication table. Put the numbers in a bag. Each player draws 8 numbers from the bag. At a signal, the players write the division facts for the numbers drawn. The player finishing first is the winner.

2. Have the students use the multiplication table as they list:

- a. all the numbers up to 20 that are divisible by 2, 4, and 8;
- b. all the numbers up to 30 that are divisible by 3, 6, and 9;
- c. all the numbers up to 50 that are divisible by 5 and 10.

3. Prepare arrays on construction paper and display them in the classroom. Ask the students to write two related division facts for each.



$$42 \div 6 = 7$$

$$42 \div 7 = 6$$

## Enrichment

1. Provide Plasticene for the students to use as they solve *Cut That Out* at the bottom of page 135.

2. Have the students list addition, subtraction, multiplication, and division examples in which the answer is 6, 7, 8, or 9. Display the findings.

6
4 + 2
21 - 15
6 × 1
24 ÷ 4

7

8

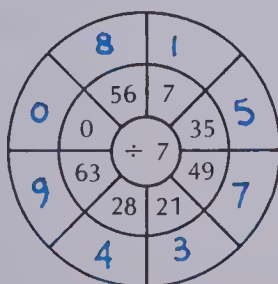
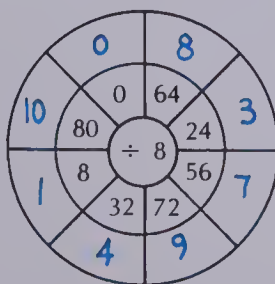
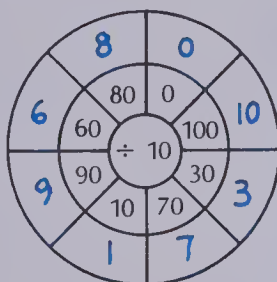
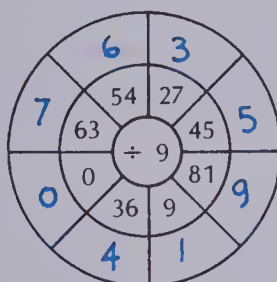
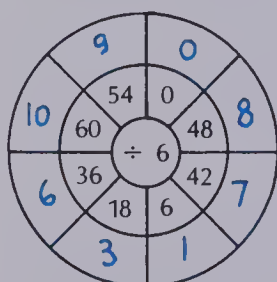
9

## Extra Practice

Complete.

## Worksheet A35

Pages 134-135





## UNIT 6 LESSON 10

### Objective PS6

Solve simple word problems, division problems.

### Introducing the Lesson

Ask the students to suggest everyday situations in which simple division is needed in terms of sharing and of partitioning items in a set. Many of these situations will be concerned with the packing, buying, selling, and distributing of items. List the situations on the chalkboard as they are suggested; keep the list for later use.

### Teaching the Lesson

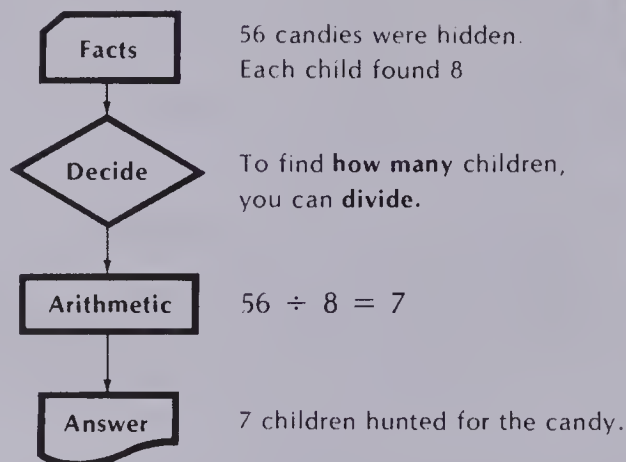
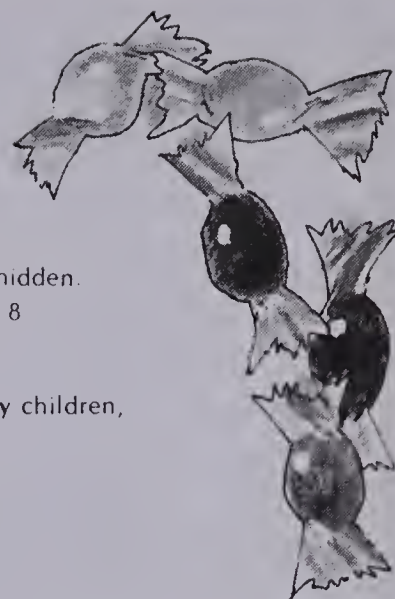
Read and discuss the problem at the top of page 136. Show the students how to apply the four problem-solving steps, given in the flow chart, to the problem.

- a. List the **facts**.
- b. **Decide** on the operation to use.  
56 candies partitioned into groups of 8 each  
How many groups? *Divide*.
- c. Do the **arithmetic**.  
 $56 \div 8 = 7$
- d. **Answer** the question.  
There were 7 groups.

Devise similar problems for the students to solve using the sharing and partitioning situations listed earlier on the chalkboard. Have the students use the four problem-solving steps as they solve the problems. Include also a few problems which require multiplication for their solution. Students should be able to distinguish whether division or multiplication is required for the solution of a problem.

## Problem Solving

For a Candy Hunt, 56 candies were hidden. Each child in the Hunt found 8 candies. How many children hunted for the candy?



### EXERCISES

Solve.

1. A candy company packs Easter eggs in packages of 3.  
How many packages do you need to have 15 eggs? **5**
2. At a bakery, a package of 6 special Halloween cookies sells for 60¢.  
How much does each cookie cost? **10¢**
3. At a party, 8 children bring 6 baseball cards each.  
How many cards are there in all? **48**
4. Uncle Matt had 24 old coins and 18 stamps.  
He gave them to his 3 nephews to share equally.  
How many coins did each nephew get? **8**

136

### Using the Exercises

- Have the students solve questions 1 to 4 individually. Follow this with a detailed discussion of each problem. Ask a student to draw a picture to illustrate each problem at the chalkboard. Ask the students if they understand why multiplication is used in question 3. Point out the unnecessary or extra information given in question 4.

## PRACTICE

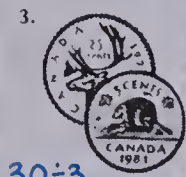
Solve.

- Joan's mother bought 70 birth announcement cards. They came in packages of 10. How many packages did she buy? **7**
- In Alex's family, the 4 children shared 24 pictures that their dad brought home. How many pictures did each one get? **6**

Write and solve a story problem for each picture.

$$8 \div 2 = 4$$

3.



$$30 \div 3$$



10¢  
each

4.



## REVIEW

Divide.

**2**

$$1. \ 6 \overline{)12}$$

**3**

$$2. \ 6 \overline{)18}$$

**4**

$$3. \ 6 \overline{)24}$$

**6**

$$4. \ 6 \overline{)36}$$

**8**

$$5. \ 6 \overline{)48}$$

A32

$$6. \ 7 \overline{)0}$$

**2**

$$7. \ 7 \overline{)14}$$

**4**

$$8. \ 7 \overline{)28}$$

**9**

$$9. \ 7 \overline{)63}$$

**10**

$$10. \ 7 \overline{)70}$$

A33

$$11. \ 8 \overline{)8}$$

$$12. \ 8 \overline{)24}$$

$$13. \ 8 \overline{)40}$$

$$14. \ 8 \overline{)56}$$

$$15. \ 8 \overline{)64}$$

$$16. \ 9 \overline{)27}$$

$$17. \ 9 \overline{)45}$$

$$18. \ 9 \overline{)63}$$

$$19. \ 9 \overline{)72}$$

$$20. \ 9 \overline{)90}$$

A34

$$21. \ 10 \overline{)0}$$

$$22. \ 10 \overline{)30}$$

$$23. \ 10 \overline{)50}$$

$$24. \ 10 \overline{)80}$$

$$25. \ 10 \overline{)100}$$

A35

$$26. \ 6 \overline{)18}$$

$$27. \ 7 \overline{)21}$$

$$28. \ 8 \overline{)32}$$

$$29. \ 9 \overline{)81}$$

$$30. \ 10 \overline{)90}$$

$$31. \ 8 \overline{)72}$$

$$32. \ 10 \overline{)70}$$

$$33. \ 6 \overline{)54}$$

$$34. \ 9 \overline{)54}$$

$$35. \ 7 \overline{)42}$$

137

## Assigning the Practice

Minimum: 1-4

Average: 1-4

Enriched: 1-4

## Review Exercises

Questions	Objective	Pages
1-10	A32	128-129
11-20	A33	130-131
21-25	A34	132-133
26-35	A35	134-135

## Reinforcement

1. Ask the students to make up four word problems (one each of multiplication, division, addition, and subtraction). Use the problems for a relay game.

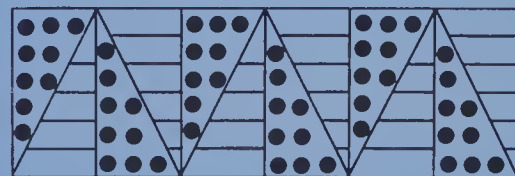
2. Illustrate several problem situations similar to questions 3 and 4 on page 137 on stiff cards.

Display these cards in the classroom. Ask the students to write word problems for the illustrations. Encourage them to use operations other than division. Compile their word problems on a worksheet for the class to solve.

## Enrichment

1. Ask the students to rewrite the word problems on pages 136 and 137 changing those which require division to ones requiring multiplication and vice versa.

2. Have the students write a division or a multiplication example as they answer each question.



How many of the 12 triangles have bars?  
How many bars in all?  
How many of the triangles have circles?  
How many circles in all?

3. Ask the students to determine the number of rectangles in the above figure.

## Problem Solving Activities

Assign Level 4, Unit 5

## Extra Practice

## Worksheet PS6

Pages 136-137

Solve.


- Six handmade dolls sold for \$48. How much did each one cost? **\$8**
- Five people share a 10 kg gift of cheese. How much cheese does each person receive? **2kg**
- Sue's father had a birthday cake with 45 candles. The candles were arranged in 5 rows. How many were in each row? **9**
- Peter baked 3 tins of muffins. Each tin holds 8 muffins. How many muffins did he bake in all? **24**
- Mrs. Long has 36 long nails and 28 screws. She needs 4 screws for each shelf that she is fastening to the wall. How many shelves can she fasten to the wall? **7**

Unit 6 Objective	Test Questions	Pages
A27	1-5	118-119
A28	6-10	120-121
A29	11-15	122-123
A30	16-20	124-125
A31	6-20	126-127
A32	21-25	128-129
A33	26-30	130-131
A34	31-35	132-133
A35	21-35	134-135
PS	36-38	

# TEST

# UNIT 6

Write 2 division facts for each array.

1.   
 $8 \div 4 = 2$   
 $8 \div 2 = 4$

2.   
 $24 \div 6 = 4$   
 $24 \div 4 = 6$

Write a division fact.

3.  $5 \times 3 = 15$

$15 \div 5 = 3$

4.  $4 \times 7 = 28$

$28 \div 4 = 7$

5.  $8 \times 9 = 72$

$72 \div 8 = 9$

Divide.

6.  $2 \overline{)6}$   $3$

7.  $2 \overline{)14}$   $7$

8.  $2 \overline{)20}$   $10$

9.  $3 \overline{)21}$   $7$

10.  $3 \overline{)27}$   $9$

11.  $4 \overline{)12}$   $3$

12.  $4 \overline{)20}$   $5$

13.  $5 \overline{)25}$   $5$

14.  $5 \overline{)35}$   $7$

15.  $5 \overline{)50}$   $10$

16.  $1 \overline{)4}$   $4$

17.  $1 \overline{)7}$   $7$

18.  $1 \overline{)1}$   $1$

19.  $2 \overline{)0}$   $0$

20.  $8 \overline{)0}$   $0$

21.  $6 \overline{)36}$   $6$

22.  $6 \overline{)30}$   $5$

23.  $7 \overline{)14}$   $2$

24.  $7 \overline{)49}$   $7$

25.  $7 \overline{)56}$   $8$

26.  $8 \overline{)24}$   $3$

27.  $8 \overline{)40}$   $5$

28.  $8 \overline{)64}$   $8$

29.  $9 \overline{)72}$   $8$

30.  $9 \overline{)54}$   $6$

31.  $10 \overline{)0}$   $0$

32.  $10 \overline{)40}$   $4$

33.  $10 \overline{)50}$   $5$

34.  $10 \overline{)80}$   $8$

35.  $10 \overline{)100}$   $10$

Solve.

36. At a party, 30 cookies were shared.  
Each person ate 3 cookies and 2 pieces of fruit.  
How many people were at the party?  $10$

37. At Wolfe Public School, 72 children turned out for a Sports Day.  
They were divided into teams of 8.  
How many teams were there?  $9$

38. There are 6 charms on each bracelet.  
48 charms would be enough for how many bracelets?  $8$

## Post-test

## Unit 6

Write two division facts for each array.

1. 

$36 \div 9 = 4$

$36 \div 4 = 9$

2. 

$35 \div 7 = 5$

$35 \div 5 = 7$

Write a division fact.

3.  $8 \times 8 = 64$

$64 \div 8 = 8$

4.  $7 \times 4 = 28$

$28 \div 7 = 4$

5.  $9 \times 6 = 54$

$54 \div 9 = 6$

Divide.

6.  $3 \overline{)12}$   $4$

7.  $2 \overline{)14}$   $7$

8.  $3 \overline{)24}$   $8$

9.  $2 \overline{)2}$   $1$

10.  $3 \overline{)15}$   $5$

11.  $4 \overline{)20}$   $5$

12.  $5 \overline{)35}$   $7$

13.  $4 \overline{)32}$   $8$

14.  $5 \overline{)15}$   $3$

15.  $4 \overline{)36}$   $9$



## MULTIPLICATION

Write 2 multiplication facts for each array.

1.  $\begin{array}{ccc} * & * & * \\ * & * & * \\ * & * & * \\ * & * & * \end{array}$   $4 \times 3 = 12$   
 $3 \times 4 = 12$

2.  $\begin{array}{cccccc} * & * & * & * & * & * \\ * & * & * & * & * & * \\ * & * & * & * & * & * \end{array}$   $6 \times 3 = 18$   
 $3 \times 6 = 18$

Write a multiplication fact.

3.  $8 + 8 + 8 = 24$   $3 \times 8 = 24$  4.  $6 + 6 + 6 + 6 + 6 = 30$   $5 \times 6 = 30$  5.  $3 + 3 + 3 = 9$   $3 \times 3 = 9$

Multiply.

6. $\begin{array}{r} 2 \\ \times 6 \\ \hline 12 \end{array}$	7. $\begin{array}{r} 3 \\ \times 3 \\ \hline 9 \end{array}$	8. $\begin{array}{r} 3 \\ \times 7 \\ \hline 21 \end{array}$	9. $\begin{array}{r} 7 \\ \times 2 \\ \hline 14 \end{array}$	10. $\begin{array}{r} 3 \\ \times 9 \\ \hline 27 \end{array}$
11. $\begin{array}{r} 4 \\ \times 4 \\ \hline 16 \end{array}$	12. $\begin{array}{r} 6 \\ \times 5 \\ \hline 30 \end{array}$	13. $\begin{array}{r} 5 \\ \times 8 \\ \hline 40 \end{array}$	14. $\begin{array}{r} 5 \\ \times 7 \\ \hline 35 \end{array}$	15. $\begin{array}{r} 8 \\ \times 4 \\ \hline 32 \end{array}$
16. $\begin{array}{r} 0 \\ \times 6 \\ \hline 0 \end{array}$	17. $\begin{array}{r} 1 \\ \times 5 \\ \hline 5 \end{array}$	18. $\begin{array}{r} 8 \\ \times 0 \\ \hline 0 \end{array}$	19. $\begin{array}{r} 8 \\ \times 1 \\ \hline 8 \end{array}$	20. $\begin{array}{r} 0 \\ \times 0 \\ \hline 0 \end{array}$
21. $\begin{array}{r} 6 \\ \times 7 \\ \hline 42 \end{array}$	22. $\begin{array}{r} 7 \\ \times 8 \\ \hline 56 \end{array}$	23. $\begin{array}{r} 4 \\ \times 7 \\ \hline 28 \end{array}$	24. $\begin{array}{r} 9 \\ \times 6 \\ \hline 54 \end{array}$	25. $\begin{array}{r} 7 \\ \times 9 \\ \hline 63 \end{array}$
26. $\begin{array}{r} 9 \\ \times 5 \\ \hline 45 \end{array}$	27. $\begin{array}{r} 8 \\ \times 7 \\ \hline 56 \end{array}$	28. $\begin{array}{r} 9 \\ \times 8 \\ \hline 72 \end{array}$	29. $\begin{array}{r} 8 \\ \times 5 \\ \hline 40 \end{array}$	30. $\begin{array}{r} 9 \\ \times 9 \\ \hline 81 \end{array}$
31. $\begin{array}{r} 10 \\ \times 3 \\ \hline 30 \end{array}$	32. $\begin{array}{r} 10 \\ \times 5 \\ \hline 50 \end{array}$	33. $\begin{array}{r} 7 \\ \times 10 \\ \hline 70 \end{array}$	34. $\begin{array}{r} 1 \\ \times 10 \\ \hline 10 \end{array}$	35. $\begin{array}{r} 10 \\ \times 10 \\ \hline 100 \end{array}$

Solve.

36. Larry earns \$5 an hour working at a hamburger stand. He worked 8 hours Saturday. How much did he earn?  $\$40$

139

16. $\begin{array}{r} 0 \\ 4 \overline{)0} \end{array}$	17. $\begin{array}{r} 2 \\ 1 \overline{)2} \end{array}$	18. $\begin{array}{r} 0 \\ 1 \overline{)0} \end{array}$	19. $\begin{array}{r} 1 \\ 1 \overline{)1} \end{array}$	20. $\begin{array}{r} 0 \\ 7 \overline{)0} \end{array}$
21. $\begin{array}{r} 3 \\ 6 \overline{)18} \end{array}$	22. $\begin{array}{r} 9 \\ 7 \overline{)63} \end{array}$	23. $\begin{array}{r} 6 \\ 7 \overline{)42} \end{array}$	24. $\begin{array}{r} 6 \\ 6 \overline{)36} \end{array}$	25. $\begin{array}{r} 8 \\ 7 \overline{)56} \end{array}$
26. $\begin{array}{r} 6 \\ 9 \overline{)54} \end{array}$	27. $\begin{array}{r} 6 \\ 8 \overline{)48} \end{array}$	28. $\begin{array}{r} 9 \\ 8 \overline{)72} \end{array}$	29. $\begin{array}{r} 3 \\ 9 \overline{)27} \end{array}$	30. $\begin{array}{r} 7 \\ 8 \overline{)56} \end{array}$
31. $\begin{array}{r} 8 \\ 10 \overline{)80} \end{array}$	32. $\begin{array}{r} 1 \\ 10 \overline{)10} \end{array}$	33. $\begin{array}{r} 6 \\ 10 \overline{)60} \end{array}$	34. $\begin{array}{r} 10 \\ 10 \overline{)100} \end{array}$	35. $\begin{array}{r} 0 \\ 10 \overline{)0} \end{array}$

Solve.

36. Forty-nine cards are dealt to seven players. How many cards does each player receive?  $7$
37. All the cards in a game are dealt to the 5 players. Each player has 8 cards. How many cards are there in all?  $40$
38. In a card game, Mary was dealt 3 hearts and 5 spades. She used all of these cards to make number pairs. How many pairs did she make?  $4$

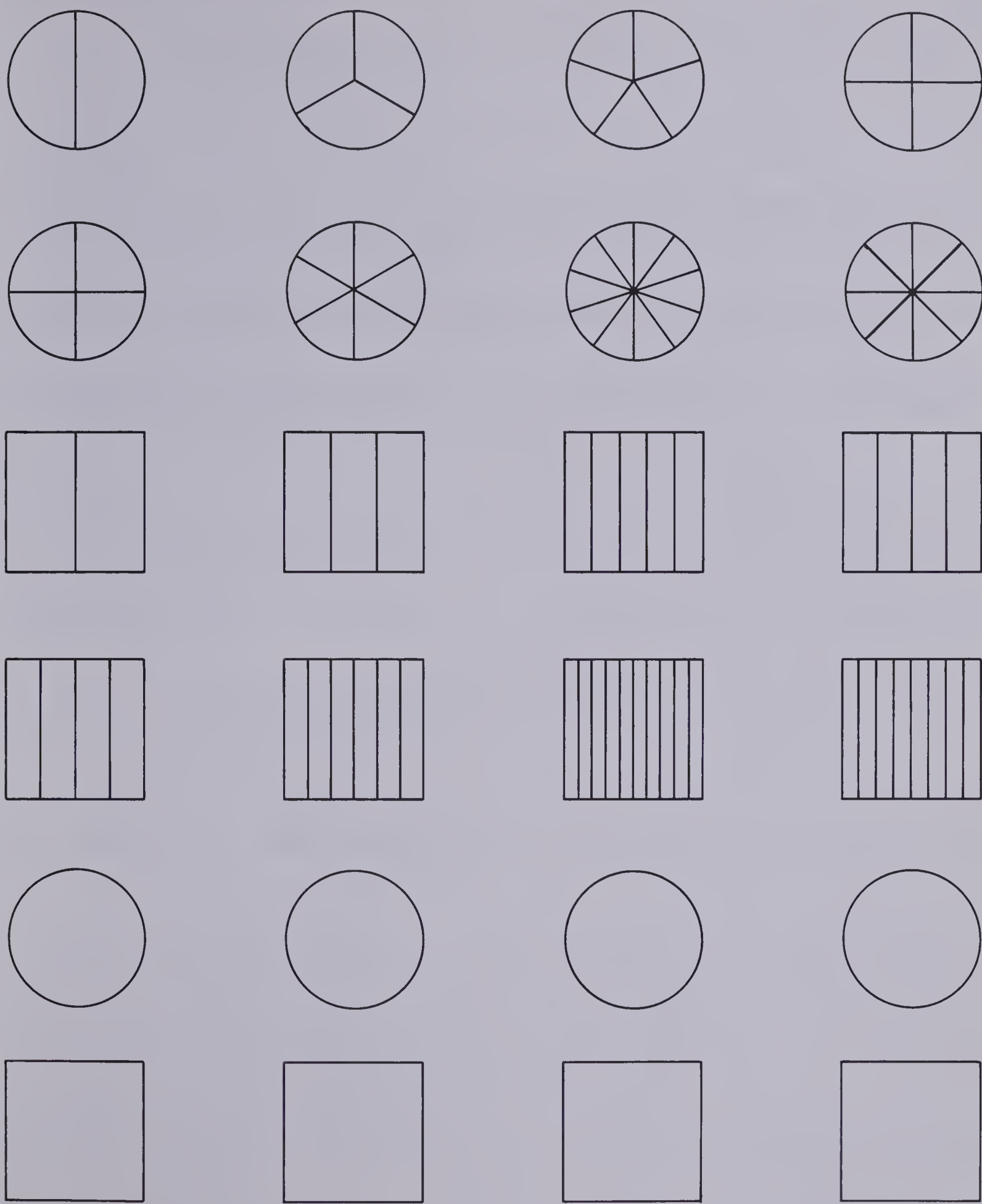
# UNIT 7

## Fractions and Decimals

Theme: Winter Olympics

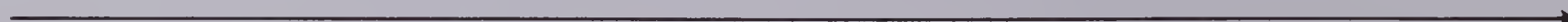
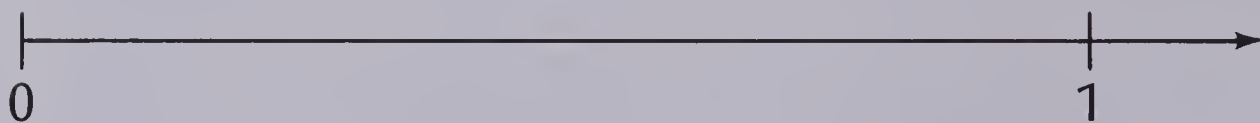
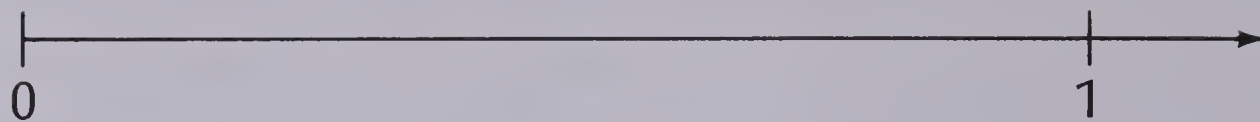
Lesson		Objective	Pages
Preview		Review symmetry.	141
1	N8	Write a fraction for the shaded part of a whole.	142-143
2	N9	Use a picture to write fraction equivalents.	144-145
3	N10	Compare fractions having the same denominator.	146-147
4	N11	Write a fraction for part of a set of objects.	148-149
5	N12	Write tenths using fraction and decimal notation.	150-151
6	N13	Write decimals equal to or greater than one.	152-153
7	M12	Measure length in decimetres; relate decimetres to centimetres and to metres.	154-155
8	A36	Add tenths.	156-157
9	A37	Subtract tenths.	158-159
10	PS7	Solve problems involving the addition and subtraction of decimals.	160-161
Test		Fractions and Decimals	162
Review		Division	163

# Fractional Parts





# Number Lines



# About This Unit

The purpose of this unit is:

1. to develop an understanding of fractional parts of one whole and of a set of objects.
2. to relate fractions and decimals written in tenths.
3. to develop addition and subtraction of decimal skills and apply these to problem situations.

Throughout this unit, fraction and decimal concepts are illustrated with “hands on” materials. For example, chocolate bars which come in sections are used to illustrate fraction equivalents in Lesson 2. A plate of two different kinds of cookies models fractional parts of a set of objects in Lesson 4. Activities such as folding paper into equal sections and shading fractional parts; shading parts of rectangles to

illustrate fraction families ( $\frac{0}{4}, \frac{1}{4}, \frac{2}{4}, \frac{3}{4}, \frac{4}{4}$ ); and

counting by tenths in fractions and decimals on a self-made number line are some of the recommended experiences to help make fractions and decimals meaningful. The Reinforcement and Enrichment sections of the teacher’s notes provide even more of these valuable suggestions.

Such experiences are extremely important at this time since most of the work is done from pictures. For example, equivalent fractions are named by studying fraction pictures.



After looking at the pictures of both fractions, the student should conclude that  $\frac{1}{5} = \frac{2}{10}$ .

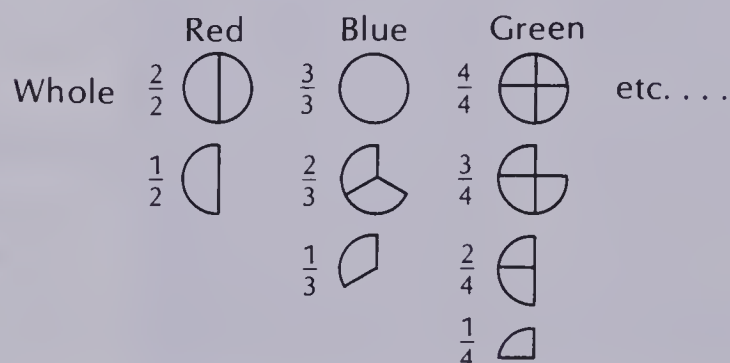
The lessons are presented in a developmental sequence. For example, if the first three lessons (which study concepts related to fractional parts of a whole) have been done successfully, the transition to Lesson 4 (which studies fractional parts of a set of objects) should be easy. Since lessons build on previous ones, it is suggested that they be covered in the given order.

# Ideas

1. Display several different kinds of packages of familiar items (gum, life-savers, small boxes of cereal, etc.). Have the students name fractional parts of these sets or an entire family for the sets, e.g.,  $\frac{0}{5}, \frac{1}{5}, \frac{2}{5}, \frac{3}{5}, \frac{4}{5}$ , or  $\frac{5}{5}$  of a package of candy.
2. Make up an information chart about the students in class. Have the students supply the information, e.g.,  $\frac{4}{27}$  of the students have red hair.
3. Once the students understand adding and subtracting decimals in tenths, have them do several of these kinds of examples on calculators. Check answers and discuss the causes of error.

## Bulletin Board Display

Draw circles on construction paper and divide them into halves, thirds, quarters, fifths, and tenths. Use felt pens to show markings. Use a different colour of construction paper to illustrate each. Under the circle displaying halves, put half a circle; under the circle displaying thirds, put  $\frac{1}{3}$  and  $\frac{2}{3}$  of a circle, etc. Order them from largest to smallest.



In displaying the tenths, both the fractional and decimal numeral can be written beside each part.

The display can be expanded upon as the lessons proceed.

This display is multi-purpose:

1. It illustrates fraction families.  
 $\frac{1}{2} = \frac{2}{4}, \frac{2}{2} = \frac{3}{3} = \frac{4}{4} \dots, \frac{2}{5} = \frac{4}{10}$  etc.
2. It illustrates equivalent fractions.
3. It illustrates order among fractions.  
 $\frac{3}{4} > \frac{1}{4}, \frac{1}{3} > \frac{1}{4}, \frac{4}{10} > \frac{7}{10}$ , etc.

# UNIT 7

## FRACTIONS & DECIMALS

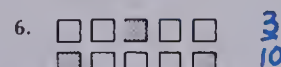
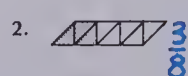


Unit 7 Objective	Test Question	Pages
N8	1-4	142-143
N9	7-10	144-145
N10	11-14	146-147
N11	5-6	148-149
N12	15-19	150-151
N13	20-21	152-153
M12	22-24	154-155
A36	25-26	156-157
A37	27-29	158-159
PS	30	

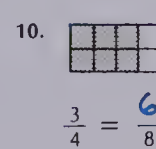
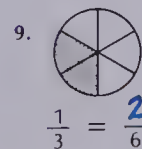
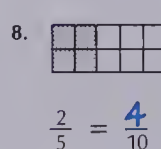
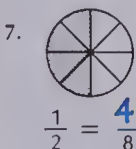
### Pretest

### Unit 7

Write a fraction for the shaded part.



Complete the fraction.



Use < or > to make a true statement.

11.  $\frac{3}{7} < \frac{5}{7}$

12.  $\frac{3}{8} > \frac{0}{8}$

13.  $\frac{4}{5} > \frac{3}{5}$

14.  $\frac{5}{6} < \frac{6}{6}$



# Symmetry

Which pictures of snowflakes are symmetric?



1. **yes**
2. **no**
3. **no**
4. **yes**
5. **yes**
6. **yes**
7. **yes**
8. **no**

9. How many **lines of symmetry** does each snowflake have? **3**

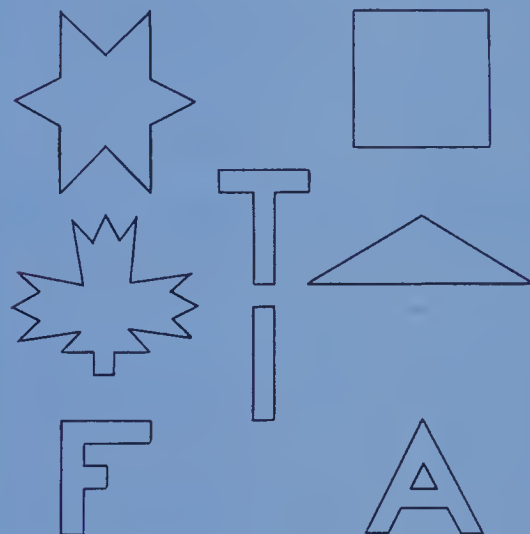
141

## UNIT 7

## PREVIEW

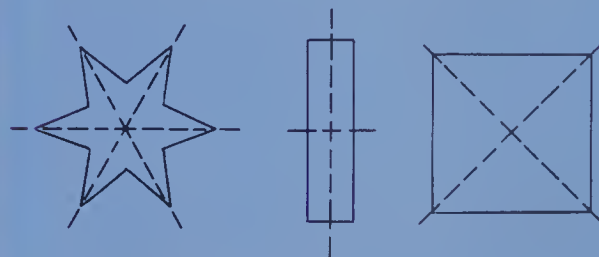
### Suggestions

Cut out several construction paper shapes as shown below. For each shape, have the students guess whether or not the shape is **symmetric** and then let a student fold the shape in half to check his or her guess.



Have the students formulate a definition for symmetric as they fold the shapes.

Point out that the fold line of the symmetrical shapes is called the *line of symmetry*. Have the students experiment with the same shapes to see how many lines of symmetry each shape has.



### About the Page

After the review of symmetry concepts, all students should be able to complete page 141 without difficulty.

### Reinforcement

Give the students construction paper and scissors. Ask them to make symmetrical shapes. When these are finished, have the students sort the shapes according to the number of lines of symmetry they have. Display the results.

Write a decimal for the shaded part.

15.  **$\frac{3}{10}$**     16.  **$\frac{9}{10}$**     17.  **$\frac{4}{10}$**

Write as a decimal.

18.  $\frac{5}{10} =$  **0.5**    19.  $\frac{9}{10} =$  **0.9**    20.  $\frac{18}{10} =$  **1.8**    21.  $\frac{12}{10} =$  **1.2**

Complete.

22. 60 cm = **6** dm    23. 9 dm = **90** cm    24. 2 dm = **0.2** m

Add or subtract.

25.  $\begin{array}{r} 8.3 \\ + 2.9 \\ \hline 11.2 \end{array}$     26.  $\begin{array}{r} 14.6 \\ + 7.6 \\ \hline 22.2 \end{array}$     27.  $\begin{array}{r} 2.6 \\ - 0.8 \\ \hline 1.8 \end{array}$     28.  $\begin{array}{r} 34.7 \\ - 5.8 \\ \hline 28.9 \end{array}$     29.  $\begin{array}{r} 20.1 \\ - 4.2 \\ \hline 15.9 \end{array}$

Solve.

30. Jerry made a 2.8 m long jump on his first try. For his second try, he jumped 0.9 m more. How long was his second jump? **3.7m**

# UNIT 7 LESSON 1

## Objective N8

Write a fraction for the shaded part of a whole.

## Introducing the Lesson

Display a large sheet of paper. Fold and tear it in half. Talk about how the whole sheet of paper was divided into two equal parts. "What is one part called?" A *half*. Ask a student to write a half, using numbers, at the chalkboard. Explain the meaning and name of each number.

$$\frac{1}{2} \leftarrow \begin{array}{l} \text{number of parts described} \\ \text{number of equal parts in all} \end{array}$$

## Teaching the Lesson

Draw a square on the chalkboard. Divide it into four equal parts. Ask: "How many parts are there? Are they the same size? What is each part called?" Shade in one part. Ask: "How many parts are shaded? How do you write one fourth?" Shade three parts of the square and repeat.



1 part shaded  
4 equal parts  
 $\frac{1}{4}$  is shaded.



3 parts shaded  
4 equal parts  
 $\frac{3}{4}$  is shaded

Explain that when all the parts of a figure are shaded, the *whole* figure is shaded. For example, if all three parts of a triangle are shaded, 3 out of the 3 parts or  $\frac{3}{3}$  are shaded. Thus,  $\frac{3}{3}$  is equal to one whole, or  $\frac{3}{3} = 1$ . Point out, too, that if none of the parts of the triangle are shaded, then 0 out of 3,  $\frac{0}{3}$ , or 0 parts are shaded.

Read and discuss the top of page 142. Ask the students to tell the amount of time elapsed when  $\frac{0}{3}$ ,  $\frac{1}{3}$ ,  $\frac{2}{3}$ , and  $\frac{3}{3}$  of the game is completed.

# Fractions: Part of a Whole



A hockey game has 3 periods.  
Each period is a **third** of the game.

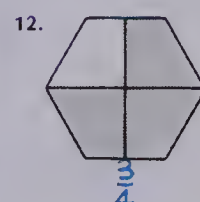
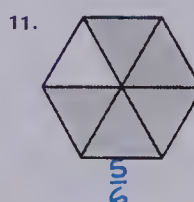
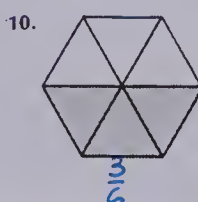
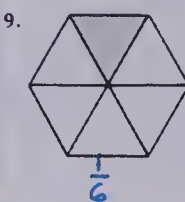
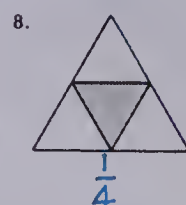
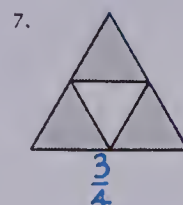
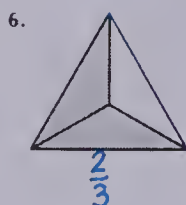
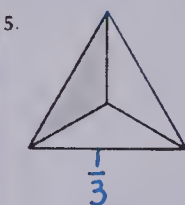
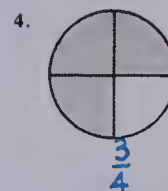
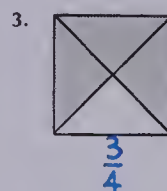
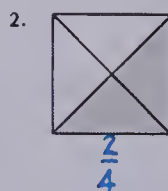
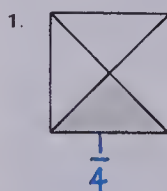
One third of the clock is shaded.  
 $\frac{1}{3}$  is shaded.



$$\frac{1}{3} \leftarrow \begin{array}{l} \text{numerator} \\ \text{denominator} \end{array}$$

## EXERCISES

What fraction of each whole is shaded?



142

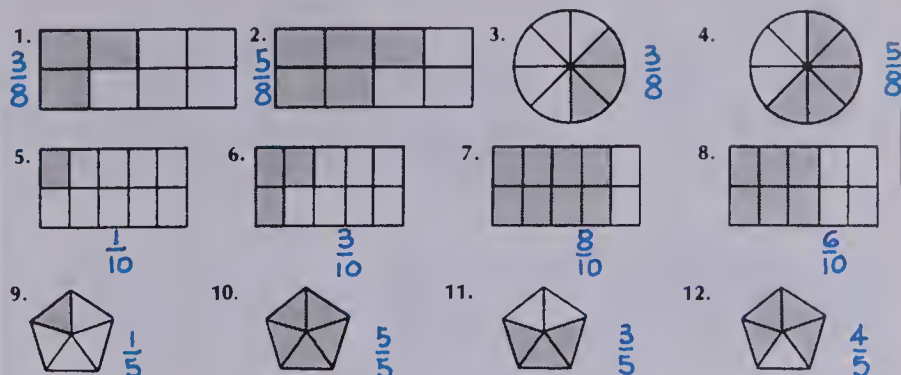
## Using the Exercises

- Questions 1 to 12 require that the students write a fraction for the shaded part of each figure. See that the students establish the denominator, or the number of equal parts in all, first. This is especially important in the second and third rows where the same shape is maintained, but the total number of equal parts changes.



## PRACTICE

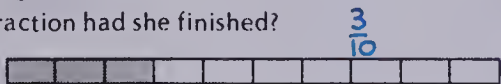
Write a fraction for the shaded part.



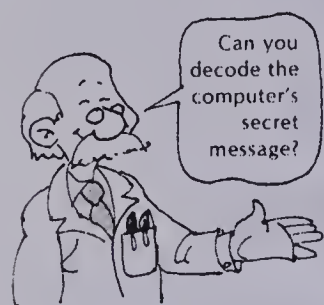
13. Draw two different pictures to show the meaning of  $\frac{5}{6}$ .

Solve. Examples:

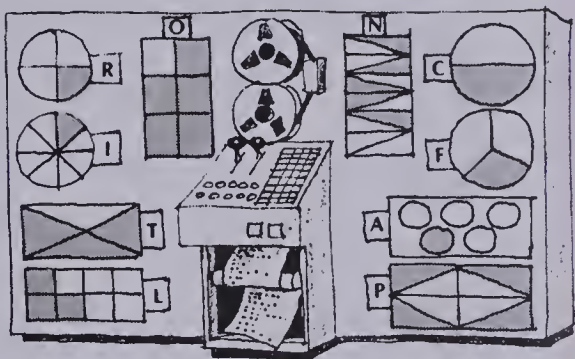
14. One 1980 Olympic Women's Cross Country Ski event was 10 km long. When Barbara Petzold had finished 3 km, what fraction had she finished?



## Secret Message!



Can you decode the computer's secret message?



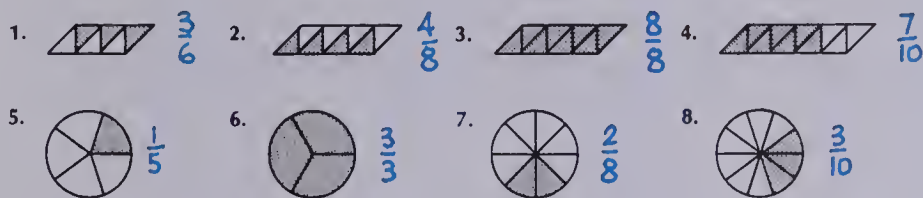
F R A C T I O N C O N T R O L

$\frac{1}{3}$   $\frac{1}{4}$   $\frac{1}{5}$   $\frac{1}{2}$   $\frac{3}{4}$   $\frac{1}{8}$   $\frac{5}{6}$   $\frac{5}{12}$   $\frac{1}{2}$   $\frac{5}{6}$   $\frac{5}{12}$   $\frac{3}{4}$   $\frac{1}{4}$   $\frac{5}{6}$   $\frac{3}{8}$

143

## Extra Practice

Write a fraction for the shaded part.



Write a fraction for the unshaded part above.

9.  $\frac{3}{6}$  10.  $\frac{4}{8}$  11.  $\frac{0}{8}$  12.  $\frac{3}{10}$

13.  $\frac{4}{5}$  14.  $\frac{0}{3}$  15.  $\frac{6}{8}$  16.  $\frac{7}{10}$

17. A garden contains carrots, lettuce, and radishes.

C	C	C	C	C
L	L	L	L	R

- a. What fraction of the garden has carrots?  $\frac{5}{10}$
- b. What fraction of the garden has lettuce?  $\frac{4}{10}$
- c. What fraction of the garden has radishes?  $\frac{1}{10}$

## Worksheet N8

Pages 142-143

## Assigning the Practice

Minimum: 1-14

Average: 1-14

Enriched: 1-14

## Reinforcement

1. Assign Secret Message at the bottom of page 143.

2. Give each student a worksheet of circles and of squares divided into varying amounts of fractional parts (provided with this Teacher's Resource Book). Have them shade fractional parts to illustrate various fractions listed on the chalkboard. Or, have the students shade fractional parts, exchange with a partner, and then label the fractions illustrated.

3. Have the students draw (or trace from the fractional parts worksheet provided with this Teacher's Resource Book) several circles or squares divided into the same number of equal parts. Ask the students to shade fractional parts to illustrate a fraction family.

For example,  $\frac{0}{5}, \frac{1}{5}, \frac{2}{5}, \frac{3}{5}, \frac{4}{5}, \frac{5}{5}$  is a fraction family.

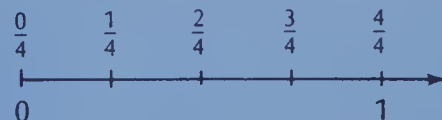
## Enrichment

1. Give the students number lines 12 cm long (provided with this Teacher's Resource Book) that show the space between 0 and 1. Ask the students to use a ruler to measure equal sections and show these fraction families on the number lines.

a.  $\frac{0}{2}, \frac{1}{2}, \frac{2}{2}$  b.  $\frac{0}{3}, \frac{1}{3}, \frac{2}{3}, \frac{3}{3}$

c.  $\frac{0}{4}, \frac{1}{4}, \frac{2}{4}, \frac{3}{4}, \frac{4}{4}$

d.  $\frac{0}{6}, \frac{1}{6}, \frac{2}{6}, \frac{3}{6}, \frac{4}{6}, \frac{5}{6}, \frac{6}{6}$



2. Make a list of sports having time limits. List the total times of each game and the times for sections of the games. Ask the students to assign a fraction to each section for each game listed.



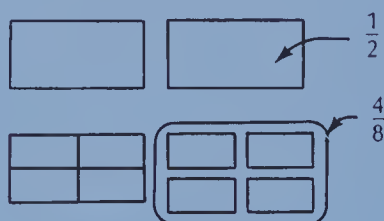
# UNIT 7 LESSON 2

## Objective N9

Use a picture to write fraction equivalents.

## Introducing the Lesson

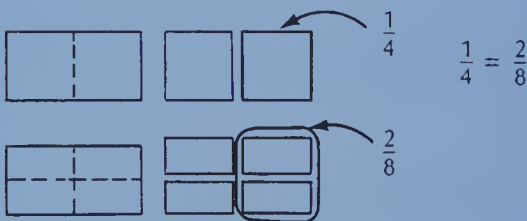
Show the class two chocolate bars that have several sections. Break one chocolate bar in half. Break half of the other bar into all of its sections. Discuss the fractional parts thus made.



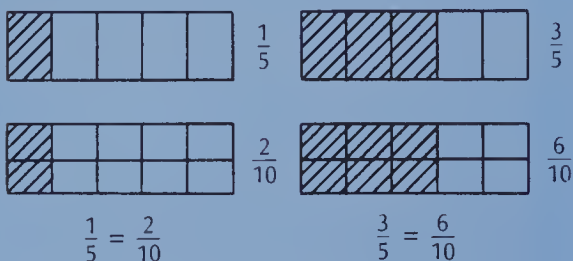
Explain that since  $\frac{1}{2}$  of the chocolate bar is the same as  $\frac{4}{8}$  of it, the two fractions are said to be **equivalent**.

## Teaching the Lesson

Continue using the chocolate bar sections to illustrate fraction equivalents.

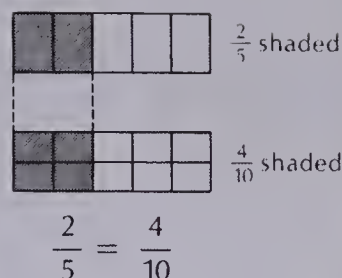
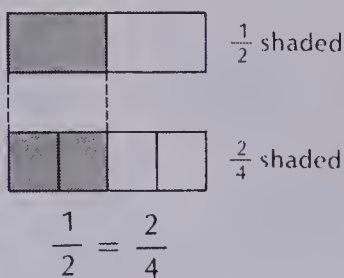


Read and discuss the top of page 144. Expand on the relationship of fifths to tenths with the other chalkboard illustrations. Ask the students to name the fraction equivalents.



Give each student several strips of 15 cm x 30 cm paper. Ask the students to use the strips in pairs to show equivalent fractions. For example, one strip of a pair can be folded in half and  $\frac{1}{2}$  of it is shaded. The other strip can be folded in fourths and  $\frac{2}{4}$  of it is shaded.

## Equivalent Fractions

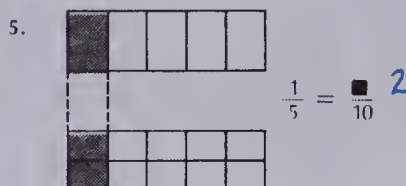
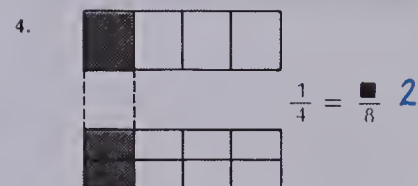
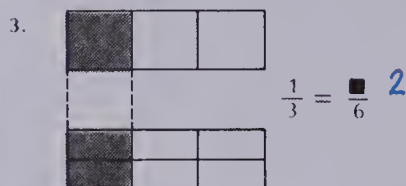
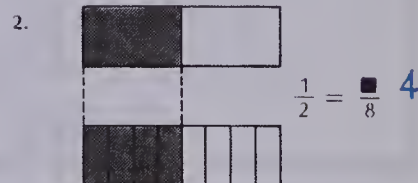
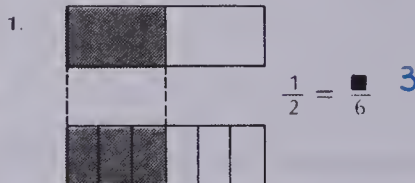


$\frac{1}{2}$  and  $\frac{2}{4}$  are **equivalent fractions**.

$\frac{2}{5}$  and  $\frac{4}{10}$  are equivalent fractions

## EXERCISE

Complete each equation.



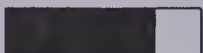
144

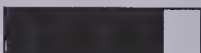
## Using the Exercises


- Questions 1 to 6 involve using an illustration to write fraction equivalents. Do the first example together. Point out that the denominator represents how many equal parts there are in all and that the missing numerator represents how many parts are shaded.


## PRACTICE


Complete each equation.


1.   
 $\frac{3}{4} = \frac{\blacksquare}{8}$  **6**


2.   
 $\frac{4}{5} = \frac{\blacksquare}{10}$  **8**


3.   
 $\frac{1}{3} = \frac{\blacksquare}{6}$  **2**

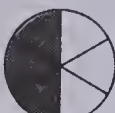
4.   
 $\frac{1}{4} = \frac{\blacksquare}{8}$  **2**

5.   
 $\frac{1}{3} = \frac{\blacksquare}{9}$  **3**

6.   
 $\frac{3}{5} = \frac{\blacksquare}{10}$  **6**

7.   
 $\frac{2}{3} = \frac{\blacksquare}{9}$  **6**

8.   
 $\frac{1}{2} = \frac{\blacksquare}{4}$  **2**

9.   
 $\frac{1}{2} = \frac{\blacksquare}{6}$  **3**

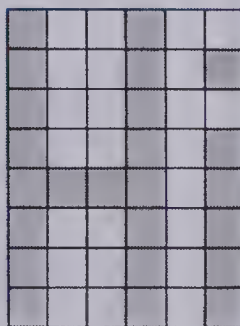
Solve.

10. Joan and Sam had candy bars the same size. Joan ate  $\frac{3}{4}$  of her candy bar. Sam ate  $\frac{6}{8}$  of his. Draw a picture to show who ate the most.

Same

## Just for Fun

- How many small squares are there in all? **48**
- How many squares are used to make the H? **18**
- How many squares are used to make the i? **6**
- Write a fraction for the number of squares forming the H  **$\frac{18}{48}$  or  $\frac{3}{8}$**
- Write a fraction for the number of squares forming the i  **$\frac{6}{48}$  or  $\frac{1}{8}$**



145

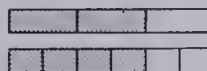
## Extra Practice

## Worksheet N9

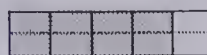
Pages 144-145


Complete each equation.


1.   
 $\frac{3}{4} = \frac{\blacksquare}{8}$  **6**

2.   
 $\frac{2}{5} = \frac{\blacksquare}{10}$  **4**

3.   
 $\frac{3}{5} = \frac{\blacksquare}{10}$  **6**

4.   
 $\frac{4}{5} = \frac{\blacksquare}{10}$  **8**

5.   
 $\frac{1}{2} = \frac{\blacksquare}{4}$  **2**

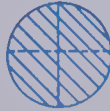
6.   
 $\frac{2}{3} = \frac{\blacksquare}{6}$  **4**

Draw a picture to show the equivalent fractions.

7.  $\frac{1}{2} = \frac{5}{10}$



8.  $\frac{2}{2} = \frac{4}{4}$



## Assigning the Practice

Minimum: 1-10

Average: 1-10

Enriched: 1-10

## Reinforcement

1. Assign *Just for Fun* at the bottom of page 145.

2. Give each student the worksheet of circles and squares divided into fractional parts. (This is provided with this *Teacher's Resource Book*.) List the following on the chalkboard. Have the students shade to find the fraction equivalents.

a.  $\frac{1}{3} = \frac{\blacksquare}{6}$  b.  $\frac{3}{5} = \frac{\blacksquare}{10}$  c.  $\frac{3}{4} = \frac{\blacksquare}{8}$

d.  $\frac{2}{3} = \frac{\blacksquare}{6}$  e.  $\frac{4}{5} = \frac{\blacksquare}{10}$  f.  $\frac{4}{4} = \frac{\blacksquare}{8}$

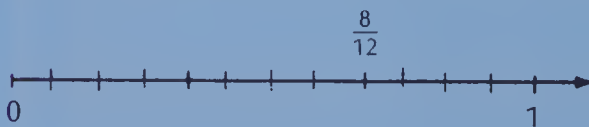
3. Make equivalent fraction cards

( $\frac{1}{3}$ ,  $\frac{2}{6}$ ,  $\frac{1}{2}$ ,  $\frac{2}{4}$ , etc.). Then play Fish or Concentration with these cards.

## Enrichment

1. Provide the students with 12 cm number lines (provided with this *Teacher's Resource Book*) that show the space between 0 and 1. With a ruler, have the students measure equal sections and show the following fraction equivalents.

a.  $\frac{1}{2} = \frac{2}{4}$  b.  $\frac{3}{6} = \frac{6}{12}$  c.  $\frac{3}{4} = \frac{9}{12}$  d.  $\frac{2}{3} = \frac{8}{12}$



2. Expand on the *Just for Fun* activity at the bottom of page 145 by asking the students not only to write a fraction for the number of squares forming the letters H and I, but also to write an equivalent fraction for each. Provide the students with graph paper to help them solve the problem.



The letter, I, takes up 6 of 48 squares.

$\frac{6}{48} = \frac{?}{?}$

# UNIT 7 LESSON 3

## Objective N10

Compare fractions having the same denominator.

### Introducing the Lesson

Place a slice of bread on an overhead projector. Cut the slice in half and point out the two halves. Show the *halves fraction family* with the pieces of bread.



Ask a student to cut a slice of bread into fourths and show the *fourths fraction family* ( $\frac{4}{4}$ ,  $\frac{3}{4}$ ,  $\frac{2}{4}$ ,  $\frac{1}{4}$ ,  $\frac{0}{4}$ ) on the overhead projector.

### Teaching the Lesson

Take the two half slices of bread. Ask, "Which is more,  $\frac{2}{2}$  or  $\frac{1}{2}$ ?" as you show the corresponding number of pieces. Lead the students to make the comparison statement  $\frac{2}{2} > \frac{1}{2}$ .

Take the piece of bread that was cut into fourths. "Which is greater,  $\frac{1}{4}$  or  $\frac{3}{4}$ ?" Ask a student to write the appropriate comparison statement  $\frac{3}{4} > \frac{1}{4}$  (or,  $\frac{1}{4} < \frac{3}{4}$ ).

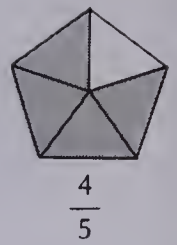
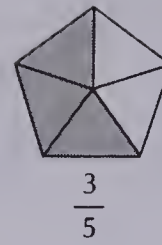
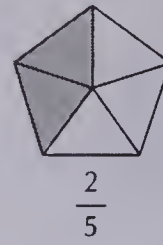
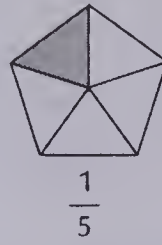
Give each student a sheet of graph paper. Ask them to trace eight rectangles that are 1 unit by 8 units. Have them shade the rectangles to show the *eighths fraction family* ( $\frac{8}{8}$ ,  $\frac{7}{8}$ ,  $\frac{6}{8}$ ,  $\frac{5}{8}$ ,  $\frac{4}{8}$ ,  $\frac{3}{8}$ ,  $\frac{2}{8}$ ,  $\frac{1}{8}$ , leaving out  $\frac{0}{8}$ ). Ask the students to think of comparison statements about the eighths and record them on the chalkboard.

$$\frac{3}{8} < \frac{4}{8} \quad \frac{7}{8} > \frac{5}{8}$$

Ask the students to observe that when we compare fractions having the same denominator, we compare only their numerators.

$$5 > 3, \text{ so } \frac{5}{8} > \frac{3}{8}$$

## Comparing Fractions



The fractions are in order from **least** to **greatest**.

Compare  $\frac{1}{5}$  and  $\frac{3}{5}$ . Which is greater?



$$\frac{3}{5} > \frac{1}{5}$$

We are comparing fifths.  $3 > 1$ , so  $\frac{3}{5} > \frac{1}{5}$ .

Compare  $\frac{2}{6}$  and  $\frac{4}{6}$ . Which is less?



$$\frac{2}{6} < \frac{4}{6}$$

We are comparing sixths.  $2 < 4$ , so  $\frac{2}{6} < \frac{4}{6}$ .

### EXERCISES

Write  $>$  or  $<$  for each ■.



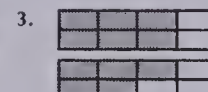
$$\frac{3}{8} \blacksquare \frac{5}{8}$$

$<$



$$\frac{7}{8} \blacksquare \frac{5}{8}$$

$>$



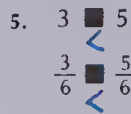
$$\frac{6}{8} \blacksquare \frac{5}{8}$$

$>$



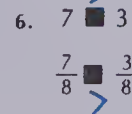
$$\frac{3}{8} \blacksquare \frac{1}{8}$$

$>$



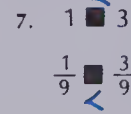
$$\frac{3}{6} \blacksquare \frac{5}{6}$$

$<$



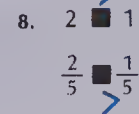
$$\frac{7}{8} \blacksquare \frac{3}{8}$$

$>$



$$\frac{1}{9} \blacksquare \frac{3}{9}$$

$<$



$$\frac{2}{5} \blacksquare \frac{1}{5}$$

$>$

### Using the Exercises

- For questions 1 to 4 an illustration accompanies the fractions to be compared.
- Questions 5 to 8 help the student focus on comparing only the numerators since the denominators are the same.



## PRACTICE

Copy each pair of numbers.

Use  $<$  or  $>$  to make a true statement.

1.  $\frac{1}{8}$   $\square$   $\frac{4}{8}$   $<$
2.  $\frac{2}{6}$   $\square$   $\frac{4}{6}$   $<$
3.  $\frac{3}{8}$   $\square$   $\frac{5}{8}$   $<$
4.  $\frac{3}{4}$   $\square$   $\frac{1}{4}$   $>$
5.  $\frac{5}{7}$   $\square$   $\frac{3}{7}$   $>$
6.  $\frac{3}{10}$   $\square$   $\frac{5}{10}$   $<$
7.  $\frac{4}{5}$   $\square$   $\frac{2}{5}$   $>$
8.  $\frac{7}{8}$   $\square$   $\frac{5}{8}$   $>$
9.  $\frac{3}{5}$   $\square$   $\frac{2}{5}$   $>$
10.  $\frac{9}{10}$   $\square$   $\frac{4}{10}$   $>$
11.  $\frac{3}{7}$   $\square$   $\frac{6}{7}$   $<$
12.  $\frac{2}{3}$   $\square$   $\frac{1}{3}$   $>$
13.  $\frac{7}{10}$   $\square$   $\frac{9}{10}$   $<$
14.  $\frac{3}{10}$   $\square$   $\frac{4}{10}$   $<$
15.  $\frac{7}{10}$   $\square$   $\frac{8}{10}$   $<$
16.  $\frac{2}{10}$   $\square$   $\frac{1}{10}$   $>$

Write the three fractions in order from least to greatest.

17.  $\frac{5}{8}, \frac{1}{8}, \frac{3}{8}$   $\frac{1}{8}, \frac{3}{8}, \frac{5}{8}$
18.  $\frac{3}{7}, \frac{1}{7}, \frac{4}{7}$   $\frac{1}{7}, \frac{3}{7}, \frac{4}{7}$
19.  $\frac{2}{6}, \frac{1}{6}, \frac{5}{6}$   $\frac{1}{6}, \frac{2}{6}, \frac{5}{6}$
20.  $\frac{7}{9}, \frac{5}{9}, \frac{2}{9}$   $\frac{2}{9}, \frac{5}{9}, \frac{7}{9}$
21.  $\frac{7}{10}, \frac{3}{10}, \frac{1}{10}$   $\frac{1}{10}, \frac{3}{10}, \frac{7}{10}$
22.  $\frac{7}{10}, \frac{9}{10}, \frac{8}{10}$   $\frac{7}{10}, \frac{8}{10}, \frac{9}{10}$

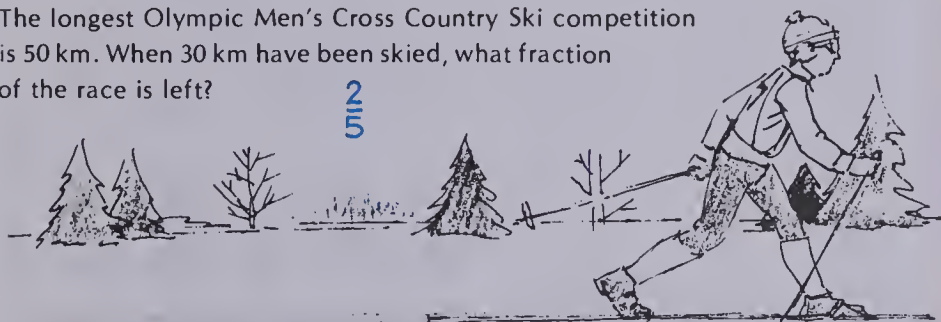
Solve.

23. There are 4 people on each team for the Olympic Cross Country Ski Relay. Each person skis the same distance. When 1 person is finished, what fraction of the race is finished?  $\frac{1}{4}$

## Long Ski

The longest Olympic Men's Cross Country Ski competition is 50 km. When 30 km have been skied, what fraction of the race is left?

$\frac{2}{5}$



147

## Assigning the Practice

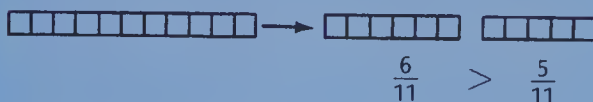
Minimum: 1-19

Average: 5-23

Enriched: 5-23

## Reinforcement

1. Ask the students to work with a partner. Give each pair of students interlocking cubes. Ask one student to make a "cube train" and give it to his or her partner. The partner breaks apart the "train" into two sections, writes a fraction for each section, and then makes a comparison statement about the fractions. Partners then switch roles.



2. Have the students write the following fractions in order from least to greatest. As this is done they will decode the letters of a special event.

$\frac{3}{9}$	$\frac{9}{9}$	$\frac{0}{9}$	$\frac{7}{9}$	$\frac{2}{9}$	$\frac{5}{9}$
N	R	W	E	I	T

$\frac{4}{12}$	$\frac{10}{12}$	$\frac{2}{12}$	$\frac{0}{12}$	$\frac{6}{12}$	$\frac{8}{12}$	$\frac{12}{12}$	$\frac{1}{12}$
M	C	Y	O	P	I	S	L

## Enrichment

1. Assign *Long Ski* at the bottom of page 147. Ask the students to draw a number line showing the multiples of 10 to 50 to illustrate the problem.

2. Give the students 12 cm number lines (provided with this *Teacher's Resource Book*) that show the space between 0 and 1. With a ruler, have the students measure equal sections and then prove (or disprove) the following comparison statements.

a.  $\frac{4}{6} < \frac{5}{6}$    b.  $\frac{2}{2} < \frac{1}{2}$    c.  $\frac{3}{4} > \frac{4}{5}$    d.  $\frac{1}{12} > \frac{0}{12}$



## Extra Practice

## Worksheet N10

Pages 146-147

Use  $<$  or  $>$  to make a true statement.

1.  $\frac{3}{8}$   $\square$   $\frac{4}{8}$   $<$
2.  $\frac{4}{7}$   $\square$   $\frac{2}{7}$   $>$
3.  $\frac{3}{10}$   $\square$   $\frac{7}{10}$   $<$
4.  $\frac{4}{9}$   $\square$   $\frac{5}{9}$   $<$

Draw a picture to show each comparison statement.

5.  $\frac{1}{4} < \frac{3}{4}$
6.  $\frac{2}{3} < \frac{3}{3}$
7.  $\frac{2}{5} > \frac{1}{5}$
8.  $\frac{6}{8} < \frac{8}{8}$

Write the three fractions in order from least to greatest.

9.  $\frac{3}{9}, \frac{2}{9}, \frac{4}{9}$   $\frac{2}{9}, \frac{3}{9}, \frac{4}{9}$
10.  $\frac{1}{2}, \frac{0}{2}, \frac{2}{2}$   $\frac{0}{2}, \frac{1}{2}, \frac{2}{2}$
11.  $\frac{4}{7}, \frac{2}{7}, \frac{3}{7}$   $\frac{2}{7}, \frac{3}{7}, \frac{4}{7}$
12.  $\frac{4}{11}, \frac{1}{11}, \frac{9}{11}$   $\frac{1}{11}, \frac{4}{11}, \frac{9}{11}$
13.  $\frac{5}{6}, \frac{1}{6}, \frac{6}{6}$   $\frac{1}{6}, \frac{5}{6}, \frac{6}{6}$
14.  $\frac{4}{10}, \frac{5}{10}, \frac{3}{10}$   $\frac{3}{10}, \frac{4}{10}, \frac{5}{10}$

# UNIT 7 LESSON 4

## Objective N11

Write a fraction for part of a set of objects.

## Introducing the Lesson

Review the meaning of the *numerator* and *denominator* in a fraction.

$\frac{3}{4}$  ← number of parts described  
4 ← number of parts in all

## Teaching the Lesson

Display a plate of ten cookies of two different kinds. Explain that this is a set of cookies. Ask, "How many cookies are there in all?" *Ten*. "How many are chocolate chip cookies?" *Seven*. Lead the students to determine the fraction of the set of cookies that are chocolate chip.

$\frac{7}{10}$  ← Seven are chocolate chip.  
10 ← There are ten cookies in all.

Ask six students to come to the front of the room. "How many students in all? How many boys? What fraction of the set of students are boys?" Have the students devise the fraction.

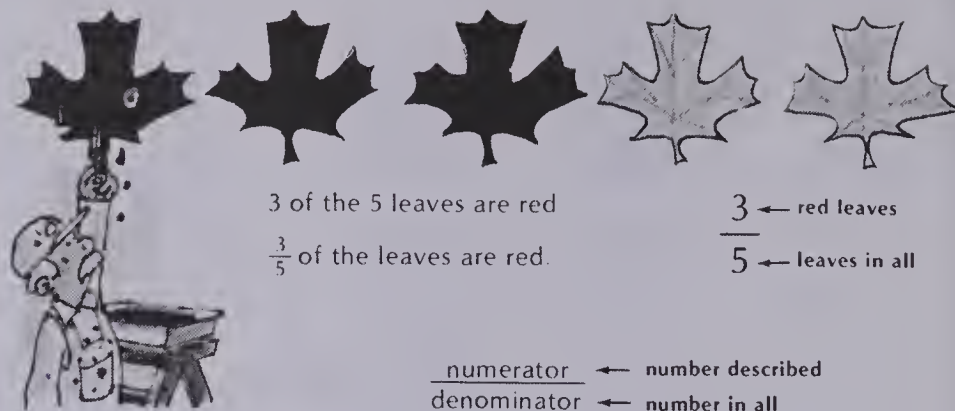
Ask the students, "How many boys are in class? How many of them wear glasses? What fraction of the set of boys wears glasses? What fraction of the set of students has red hair?"

Draw sets of circles or squares on the chalkboard. Shade or circle part of the set. Have the students name the fraction of the set illustrated.

Show the set of maple leaves at the top of page 148. Point out how the illustration shows that  $\frac{3}{5}$  of the leaves are red.

Ask the students to illustrate a fraction of a set of objects. They may use books, pencils, crayons, people, chalkboard drawings, etc. Tell them how many objects to use in all. Then they decide on the part of the set they wish to consider, or describe and record the appropriate fraction on the chalkboard.

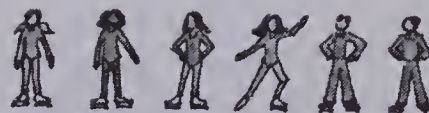
## Fractions of a Set



## EXERCISES

Copy and complete

- $\frac{4}{6}$  girl skaters
- $\frac{4}{6}$  of the skaters are girls.
- $\frac{2}{5}$  Canadian flags
- $\frac{2}{5}$  of the flags are Canadian.
- $\frac{3}{8}$  yellow stars
- $\frac{3}{8}$  of the stars are yellow.
- $\frac{8}{10}$  triangles
- $\frac{8}{10}$  of the figures are triangles.



## Using the Exercises

- Questions 1 to 8 help students determine the fraction of a set by requiring first that they write the number of items described as part of the total set, that is, the numerator. Have the students count the total number of items in each set to check the given denominator. Question 8 requires that both the numerator and denominator be determined.

## PRACTICE

What fraction of the set is shaded?

- $\frac{3}{4}$
- $\frac{2}{3}$
- $\frac{3}{5}$
- $\frac{3}{5}$
- $\frac{2}{5}$
- $\frac{3}{6}$
- $\frac{3}{8}$
- $\frac{5}{7}$

Write the fraction.

- 6 players on a hockey team. 2 are on defence.  $\frac{2}{6}$
- 6 gold medals for the U.S. Eric Heiden won 5 of them.  $\frac{5}{6}$
- 38 gold medals at the 1980 Winter Olympics. The Soviet Union won 10.  $\frac{10}{38}$

## REVIEW

Write a fraction for the shaded part.

- $\frac{2}{4}$
- $\frac{1}{6}$
- $\frac{1}{3}$
- $\frac{5}{8}$

Complete.

- $\frac{4}{6}$
- $\frac{4}{10}$

Copy each pair of numbers.

Use  $<$  or  $>$  to make a true statement.

- $\frac{3}{8} < \frac{5}{8}$
- $\frac{3}{3} > \frac{2}{3}$
- $\frac{1}{4} < \frac{3}{4}$
- $\frac{4}{5} > \frac{2}{5}$

Write the fraction.

- 10 hockey sticks. 2 are broken.  $\frac{2}{10}$
- 6 houses. 3 are white.  $\frac{3}{6}$

149

## Assigning the Practice

Minimum: 1-10

Average: 1-11

Enriched: 1-11

## Review Exercises

Questions	Objective	Pages
1-4	N8	142-143
5-6	N9	144-145
7-10	N10	146-147
11-12	N11	148-149

## Reinforcement

1. Write the following fractions on the chalkboard. Review the terms numerator, denominator, and set as you ask the students to answer the questions about the fractions.

$\frac{3}{5}$	$\frac{4}{5}$	$\frac{3}{4}$	$\frac{2}{4}$	$\frac{2}{5}$	$\frac{3}{10}$
$\frac{4}{10}$	$\frac{5}{8}$	$\frac{9}{10}$	$\frac{1}{3}$	$\frac{7}{8}$	$\frac{5}{10}$

- Write the set of fractions that have 3 as the numerator.
- Write the set of fractions that have 5 as the denominator.
- Write the set of fractions that have 10 as the denominator.

2. Give the students a 20 cm x 30 cm stiff card. Ask them to draw a set of objects on the card and shade a part of them. Collect all the cards and hold them up one by one for the students to name the fraction of the set that is shaded.

## Enrichment

Have the students draw a set of objects to prove their answers to these questions.

- What is  $\frac{1}{2}$  of 2?
- What is  $\frac{1}{4}$  of 4?
- What is  $\frac{2}{5}$  of 5?
- What is  $\frac{5}{7}$  of 7?
- What is  $\frac{9}{11}$  of 11?
- What is  $\frac{8}{8}$  of 8?

## Extra Practice

## Worksheet N11

Pages 148-149

What fraction of the set is shaded?

- $\frac{5}{6}$
- $\frac{3}{9}$
- $\frac{4}{4}$
- $\frac{5}{12}$
- $\frac{1}{7}$
- $\frac{4}{15}$
- $\frac{8}{8}$
- $\frac{0}{3}$
- $\frac{6}{14}$

Write the fraction

- 3 of the 7 children like strawberry milkshakes.  $\frac{3}{7}$
- 8 of the 10 girls can skate.  $\frac{8}{10}$
- 5 of the 30 students are left-handed.  $\frac{5}{30}$



# UNIT 7 LESSON 5


## Objective N12

Write tenths using fraction and decimal notation.


## Introducing the Lesson

Discuss common examples in which different names are used for the same quantity. For example, one can say a dime or ten cents. 5 or 3 + 2, 18 or 6 threes. Explain that there are two ways of writing the fractional parts of ten. Name the two ways with an illustration.

7 out of 10, seven tenths

  $\frac{7}{10}$  or 0.7 is shaded.

10 out of 10, ten tenths or one whole

  $\frac{10}{10}$  or 1.0 is shaded.

Ask the students to count by tenths to one whole as you point to the corresponding sections of the above illustration. Have one student record the

count in fractions ( $\frac{1}{10}, \frac{2}{10}, \frac{3}{10}, \dots, \frac{10}{10}$ ) on the

chalkboard and another student record the count in decimals (0.1, 0.2, 0.3, ... 1.0).

## Teaching the Lesson

Show the students where tenths fit into our base ten number system with a place-value chart. Point out how each place is ten times greater than the place to its right. Explain that the ones place is, therefore, ten times greater than the tenths place.

100s	10s	1s	$\frac{1}{10}s$
------	-----	----	-----------------

100 = 10 tens

10 = 10 ones

1 = 10 tenths

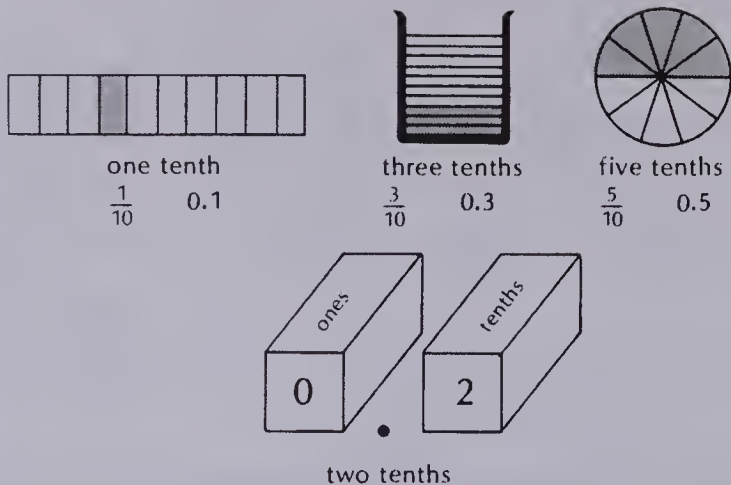
Point out that when writing some decimals in tenths a zero is written in the ones place to indicate that there are no ones.

1s	$\frac{1}{10}s$
0	4

0 ones + 4 tenths

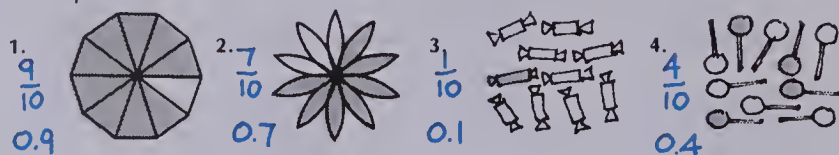
However, 10 tenths requires a 1 in the ones place since it is the same as one whole.

## Decimal Notation



## EXERCISES

Write the fraction and the decimal that tell how much of the picture is coloured.



Write as fractions.

5. 0.6  $\frac{6}{10}$  6. 0.4  $\frac{4}{10}$  7. 0.9  $\frac{9}{10}$  8. 0.2  $\frac{2}{10}$  9. 0.7  $\frac{7}{10}$

Write as decimals.

10.  $\frac{1}{10}$  0.1 11.  $\frac{8}{10}$  0.8 12.  $\frac{5}{10}$  0.5 13.  $\frac{3}{10}$  0.3 14.  $\frac{4}{10}$  0.4

Write the decimals from 0.0 to 1.0.

- 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0

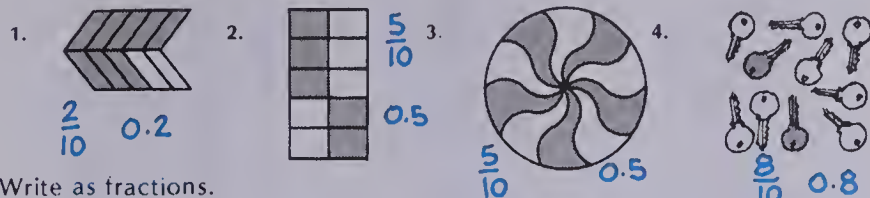
150

## Using the Exercises

- Questions 1 to 14 require an understanding of how to write tenths using fraction and decimal notation. See that the students write the zero in the ones place for the decimals.
- Question 15 requires the students to count by tenths from 0.0 to 1.0. Point out that this is the same as counting by tenths from 0 to 1.

## PRACTICE

Write the fraction and the decimal that tell how much of the picture is *not* coloured.



Write as fractions.



Write as decimals.



Norway won 10 medals at the 1980 Winter Olympics.

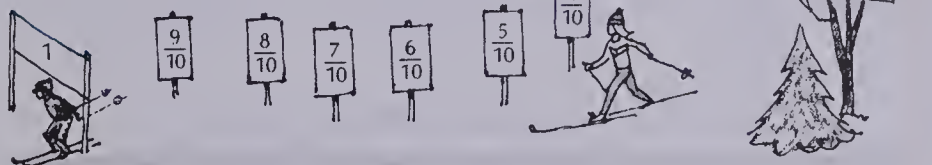
15. One of the medals was gold. What decimal part of their medals were gold medals?  $\frac{1}{10}$
16. Six of the medals were bronze. What decimal part of their medals were bronze medals?  $\frac{6}{10}$

## USING THE CALCULATOR

Write each numeral.

Use a calculator to find each sum.

- 0.4 one tenth + three tenths  
0.9 two tenths + seven tenths  
1.0 four tenths + six tenths  
1.0 five tenths + five tenths



151

## Assigning the Practice

Minimum: 1-15

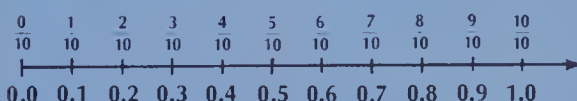
Average: 1-16

Enriched: 1-16

## Reinforcement

1. Draw several sets of ten objects on the chalkboard. Shade in parts of the sets and ask the students to write the fraction and the decimal for the shaded part.

2. Give each student a worksheet of number lines showing the space between 0 and 1. (This worksheet is provided with this *Teacher's Resource Book*.) Have the students measure and mark ten equal sections on the number lines with their rulers. Then ask them to label each mark as a fraction and as a decimal.



3. Have the students measure the heights of the following stacks of math book pages to the nearest tenth of a centimetre.

- a. 80 pages    b. 150 pages    c. 100 pages  
d. 180 pages    e. 220 pages    f. 50 pages

## Enrichment

1. Assign *Using the Calculator* at the bottom of page 151. Point out how calculators show tenths as decimals.

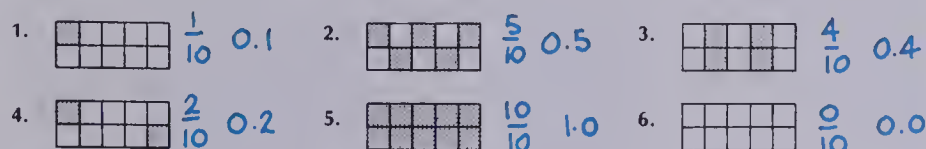
2. Ask the students to measure various classroom objects that are less than a metre in length to the nearest tenth of a metre.

## Extra Practice

## Worksheet N12

Pages 150-151

Write the fraction and the decimal for the shaded part.



Write the fraction and the decimal.

7. three tenths  $\frac{3}{10}$  0.3    8. one tenth  $\frac{1}{10}$  0.1    9. ten tenths  $\frac{10}{10}$  1.0
10. There are ten Canadian provinces. Three of them are called Prairie Provinces. Write a decimal and a fraction that tells what part are Prairie Provinces.  $\frac{3}{10}$  0.3
11. Six out of every ten people voted in an election. Write a decimal and a fraction that tells what part of the people voted.  $\frac{6}{10}$  0.6

# UNIT 7 LESSON 6

## Objective N13

Write decimals equal to or greater than one.

### Introducing the Lesson

Show a pie cut into 10 pieces. Ask the students to name and write the fraction and the decimal for :



3 pieces out of 10

9 pieces out of 10

10 pieces out of 10

Now show a second pie plate with one, then two, three, four, etc. pieces on it. Discuss how to write the fraction and decimal for the amount of pie on both plates.



12 pieces



17 pieces



$\frac{12}{10}$  or 1.2



$\frac{17}{10}$  or 1.7

Stress that whole numbers can be written with or without a decimal point and a zero in the tenths place (2.0 or 2, 1.0 or 1).

Show a place-value chart and explain how whole numbers are separated from parts of one whole by a decimal point.

whole numbers				parts of a whole
1000s	100s	10s	1s	$\frac{1}{10}$ s

### Teaching the Lesson

Point out the illustration for decimals greater than one at the top of page 152. Draw similar rectangles divided into tenths with additional tenth sections on the chalkboard. Ask the students to give the fraction and decimal for each.

Give the students long strips of paper and centimetre rulers. Ask them to draw a number line and make a mark at each centimetre. Above the number line, have the students count by tenths in fractions. Below the number line, have the students count by tenths in decimals. The whole numbers can be circled for emphasis.

Provide practice in changing fractions to decimals and decimals to fractions.

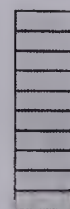
## Decimals Greater Than One



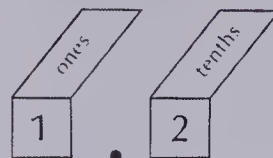
nine tenths  
 $\frac{9}{10}$  0.9



ten tenths  
 $\frac{10}{10}$  1.0



eleven tenths  
 $\frac{11}{10}$  1.1



one and two tenths

### EXERCISES

Write the fraction and the decimal that tell how much is shaded.

1.



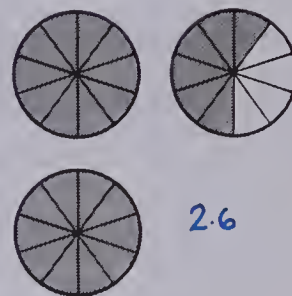
$\frac{10}{10}$  1.0

2.



$\frac{13}{10}$  1.3

3.



2.6

Write as fractions

4. 1.4  $\frac{14}{10}$

5. 1.7  $\frac{17}{10}$

6. 1.2  $\frac{12}{10}$

7. 1.5  $\frac{15}{10}$

8. 1.0  $\frac{10}{10}$

Write as decimals.

9.  $\frac{16}{10}$  1.6

10.  $\frac{11}{10}$  1.1

11.  $\frac{19}{10}$  1.9

12.  $\frac{13}{10}$  1.3

13.  $\frac{18}{10}$  1.8

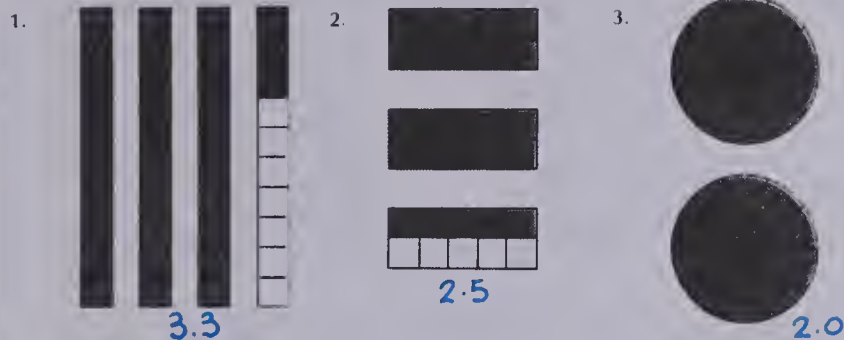
### Using the Exercises

- Questions 1 to 3 require that the students write the fraction and decimal for the shaded part of the figures. For the fractions, see that the students understand that each figure is divided into 10 equal parts so the denominator is always 10. For the decimals, see that they understand to record the numbers of whole figures shaded to the left of the decimal point and the number of parts of a whole shaded to the right.
- Questions 4 to 13 require the students to change decimals to fractions and vice versa. (When changing, for example,  $\frac{16}{10}$  to 1.6 it is not necessary to explain at this time that it means  $16 \div 10 = 1.6$ . Nor is it necessary to explain at this time that 1.6 is  $1\frac{6}{10}$  or  $\frac{16}{10}$ . Students can change these kinds of examples merely by observing patterns.)



## PRACTICE

Write the decimal that tells how much is shaded.



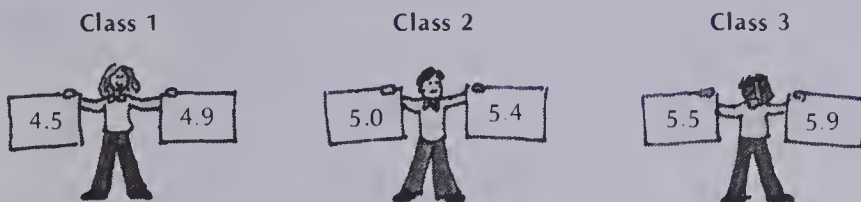
Write as decimals.

4.  $\frac{14}{10}$  1.4    5.  $\frac{32}{10}$  3.2    6.  $\frac{60}{10}$  6.0    7.  $\frac{17}{10}$  1.7    8.  $\frac{28}{10}$  2.8

Use  $<$ ,  $=$ , or  $>$  to make a true statement.

9.  $0.9 \begin{matrix} \blacksquare \\ < \end{matrix} 1.9$     10.  $3.2 \begin{matrix} \blacksquare \\ > \end{matrix} 2.3$     11.  $2.0 \begin{matrix} \blacksquare \\ < \end{matrix} 2.1$   
 12.  $0.4 \begin{matrix} \blacksquare \\ < \end{matrix} 4.0$     13.  $1.4 \begin{matrix} \blacksquare \\ > \end{matrix} 1.2$     14.  $4.0 \begin{matrix} \blacksquare \\ = \end{matrix} 4$   
 15.  $0.7 \begin{matrix} \blacksquare \\ < \end{matrix} 2.0$     16.  $3.5 \begin{matrix} \blacksquare \\ > \end{matrix} 3.2$     17.  $4.1 \begin{matrix} \blacksquare \\ > \end{matrix} 3.9$

## You Be the Judge

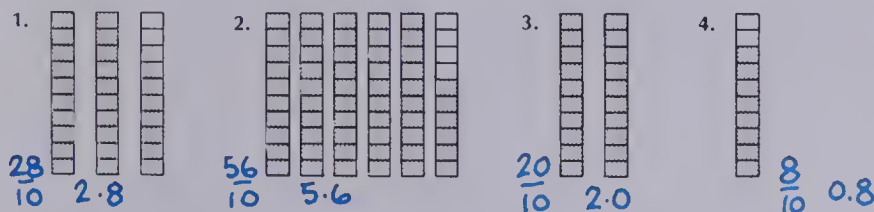


In which class does each of these cards belong?

$\begin{matrix} 5.4 \\ 2 \end{matrix}$      $\begin{matrix} 5.7 \\ 3 \end{matrix}$      $\begin{matrix} 4.8 \\ 1 \end{matrix}$      $\begin{matrix} 4.9 \\ 1 \end{matrix}$      $\begin{matrix} 5.2 \\ 2 \end{matrix}$      $\begin{matrix} 5.6 \\ 3 \end{matrix}$      $\begin{matrix} 5.1 \\ 2 \end{matrix}$  153

## Extra Practice

Write the fraction and the decimal for the shaded part.



Draw a picture of the fractions and decimals.

5.  $\frac{17}{10}$     6. 4.5    7. 1.0    8.  $\frac{50}{10}$

Use  $<$ ,  $=$ , or  $>$  to make a true statement.

9.  $6.5 \begin{matrix} \textcircled{>} \end{matrix} 5.6$     10.  $3.7 \begin{matrix} \textcircled{<} \end{matrix} 3.9$   
 11.  $0.8 \begin{matrix} \textcircled{<} \end{matrix} 8.0$     12.  $9.0 \begin{matrix} \textcircled{=} \end{matrix} 9$

## Assigning the Practice

Minimum: 1-14

Average: 1-17

Enriched: 1-17

## Reinforcement

1. Assign *You Be the Judge* at the bottom of page 153.

2. Give the students centimetre rulers. Ask them to draw line segments with these lengths.

- a. 1.6 cm      b. 4.8 cm  
 c. 13.5 cm    d. 20.0 cm  
 e. 0.3 cm      f. 24.7 cm  
 g. 11.0 cm     h. 28.2 cm

3. Set out several classroom objects for the students to measure to the nearest tenth of a centimetre.

4. Make a set of 16 cards showing fractions in tenths. Make a matching set with decimals. Place the cards face down. Players take turns turning up pairs of cards. If the cards match, the player keeps the cards and takes another turn. The player with the most cards wins.

5. Make up dot-to-dot pictures using tenths.

## Enrichment

1. Have the students draw the line segments in the second **Reinforcement** activity to the nearest tenth of a centimetre and then name each length also in millimetres.

2. Relate tenths to money as the students answer these questions.

- a. What is a tenth of one dollar?  
 b. What is a tenth of one dime?  
 c. What is a tenth of ten dollars?  
 d. What is a tenth of fifty cents?

## Worksheet N13

Pages 152-153

# UNIT 7 LESSON 7

## Objective M12

Measure length in decimetres, relate decimetres to centimetres and to metres.

## Introducing the Lesson

Ask the students to look up the meanings of these words in the dictionary: decathlon, decapod, decade. Note how each word has the same prefix which means ten or a tenth.

Talk about how important ten is in our number system. Explain that our base ten number system is called a decimal number system. Point out that ten is also important in our metric system of measurement.

## Teaching the Lesson

Hold up a metre stick. Show 10 cm. Explain that this length is also called a decimetre. Write the relationship of centimetres to decimetres on the chalkboard. 10 cm = 1 dm. Point to 20 cm, 30 cm, etc. and ask how many decimetres there would be for each. Write the relationships on the chalkboard.

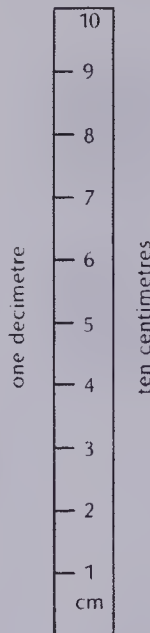
Show the entire metre stick. Count the 10 dm that make 1 m. Explain that 1 dm = 0.1 m, 2 dm = 0.2 m, 3 dm = 0.3 m, etc. as you point to the metre stick.

Read and discuss the top of page 154.

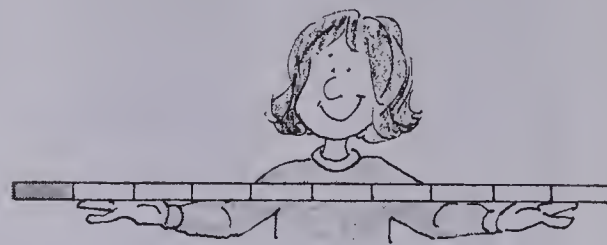
Have each student work with a partner. Give each pair of students a metre stick and a set of numbered string lengths that have been cut to an even number of decimetres. Ask the students to measure each length and record their findings in the following chart.

String number	decimetres	centimetres	metres
1	4 dm	40 cm	0.4 m
2	7 dm	70 cm	0.7 m
3			
4			

## Decimetres



A metre can be divided into 10 parts. Each part is called a **decimetre** (dm).



A decimetre is  $\frac{1}{10}$  of a metre.

A decimetre is 0.1 of a metre.

$$10 \text{ cm} = 1 \text{ dm}$$

$$20 \text{ cm} = 2 \text{ dm}$$

$$100 \text{ cm} = 10 \text{ dm} = 1 \text{ m}$$

## EXERCISES

Copy and complete.

1. 10 cm =  dm

3. 40 cm =  dm

5.  cm = 5 dm

2. 20 cm =  dm

4. 60 cm =  dm

6.  cm = 8 dm

What decimal part of a metre?

7. 1 dm =

8. 2 dm =

9. 5 dm =

10. 6 dm =

11. 9 dm =

12. 10 dm =

## Using the Exercises

- For questions 1 to 6 the students relate centimetres to decimetres and use this key fact: 10 cm = 1 dm.
- For questions 7 to 12 the students relate decimetres to metres and use this key fact: 1 dm = 0.1 m.

## PRACTICE

Copy and complete.

1. 30 cm = 3 dm
2. 50 cm = 5 dm
3. 70 cm = 7 dm
4. 90 cm = 9 dm
5. 10 cm = 1 dm
6. 20 cm = 2 dm
7. 40 cm = 4 dm
8. 100 cm = 10 dm

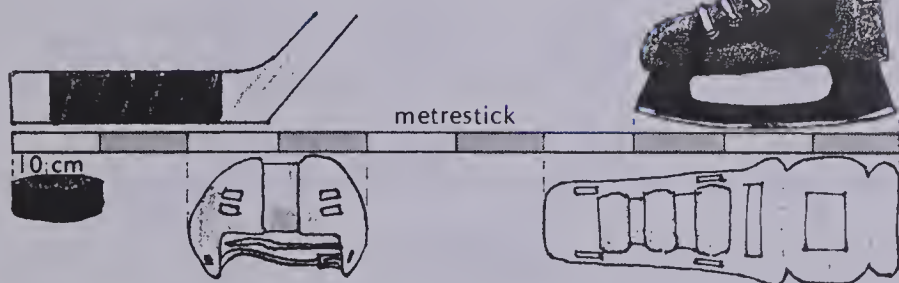
What decimal part of a metre?

9. 3 dm 0.3
10. 4 dm 0.4
11. 5 dm 0.5
12. 1 dm 0.1
13. 8 dm 0.8
14. 10 dm 1.0

How many decimetres? How many centimetres?

15. 0.1 m 1 dm 10 cm
16. 0.2 m 2 dm 20 cm
17. 0.6 m 6 dm 60 cm
18. 0.7 m 7 dm 70 cm
19. 0.5 m 5 dm 50 cm
20. 1 m 10 dm 100 cm

## Name the Hockey Lengths



Use the picture to complete these sentences.

1. The blade of the hockey stick is 3 dm long.
2. The hockey puck is 3 dm wide.
3. The helmet is 1 dm wide.
4. The hockey skate is 2 dm long.
5. The shin pad is 4 dm long.

155

## Assigning the Practice

Minimum: 1-17

Average: 1-20

Enriched: 1-20

## Reinforcement

1. Assign *Name the Hockey Lengths* at the bottom of page 155.

2. Give the students a strip of paper 1 m in length. Ask them to make their own metre stick.

3. Play a card game for two players similar to "Rummy". Make a set of ten cards showing 1 dm to 10 dm; a set of ten cards showing 0.1 m to 1 m; and a set of ten cards showing 10 cm to 100 cm. Players are dealt four cards. One player turns over a card from the centre pile and discards an unwanted card face up. The other player can choose a card either from the centre pile or from the discard pile and then discards an unwanted card. When a player gets three cards naming the same length, he or she must lay it on the table and fill up his or her hand with four new cards. When the centre pile is exhausted, the player with the most sets of matching cards wins.

## Enrichment

Have the students relate decimetres to centimetres and millimetres as they complete the following charts.

a.	decimetres	centimetres	millimetres
	1 dm		
	2 dm		
	3 dm		
	4 dm		
	5 dm		
	6 dm		
	7 dm		
	8 dm		
	9 dm		
	10 dm		

b.	millimetres	centimetres
	1 mm	
	2 mm	
	3 mm	
	4 mm	
	5 mm	

## Extra Practice

## Worksheet M12

Pages 154-155

Complete the chart.

	metres	decimetres	centimetres
1.	1 m	<u>10 dm</u>	<u>100 cm</u>
2.	<u>0.1 m</u>	1 dm	<u>10 cm</u>
3.	<u>0.4 m</u>	<u>4 dm</u>	40 cm
4.	<u>0.6 m</u>	6 dm	<u>60 cm</u>
5.	0.3 m	<u>3 dm</u>	<u>30 cm</u>
6.	<u>0.7 m</u>	<u>7 dm</u>	70 cm
7.	0.9 m	<u>9 dm</u>	<u>90 cm</u>

Measure. How many decimetres? centimetres?

8. 1.3 dm 13 cm



# UNIT 7 LESSON 9

## Objective A37

Subtract tenths.

### Introducing the Lesson

Review regrouping in subtraction with place-value number blocks.

Take 2 rods and 6 cubes from:



Subtract the cubes. Since there are not enough cubes, regroup 1 rod as 10 cubes.

Now subtract 2 rods and 6 cubes. 1 rod and 6 cubes are left.

Rename the rods to represent the ones place. Subtract  $1.1 - 0.7$  with cubes and rods.



Subtract other similar examples with rods representing the ones and cubes representing the tenths.

### Teaching the Lesson

Display ten books of various heights. Assign each book a letter. Ask ten students to measure and record the heights of the books in a table on the chalkboard. Devise subtraction problems from the information recorded. For example, "What is the difference in height between book A and book B?" Ask the students to solve the problem. One student can demonstrate the subtraction on the chalkboard.  
book A—30.8 cm, book B—23.9 cm

$$\begin{array}{r} 29\ 18 \\ 30.8 \\ -23.9 \\ \hline 6.9 \end{array}$$

The difference is 6.9 cm.

Point out how the numbers are aligned so that tenths are subtracted from tenths, ones from ones, and tens from tens. Stress the alignment of the decimal points, also.

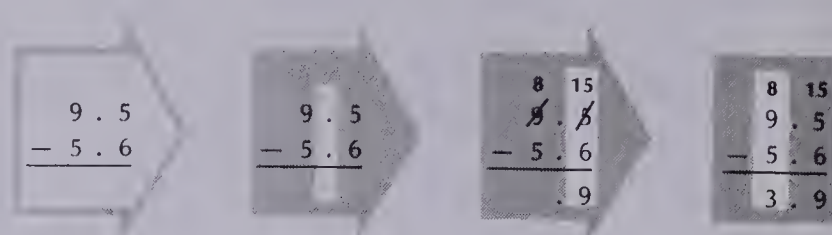
Summarize the key points involved in the subtraction of tenths on page 158.

## Subtracting Tenths

Keep the decimal points in a line.

Regroup ones and subtract tenths.

Subtract ones.



To subtract decimals:

Keep the decimal points in a line.

Regroup if necessary. Then subtract.

### EXERCISES

Subtract.

1. $\begin{array}{r} 0.8 \\ -0.3 \\ \hline 0.5 \end{array}$	2. $\begin{array}{r} 0.6 \\ -0.5 \\ \hline 0.1 \end{array}$	3. $\begin{array}{r} 1.5 \\ -1.2 \\ \hline 0.3 \end{array}$	4. $\begin{array}{r} 6.9 \\ -3.4 \\ \hline 3.5 \end{array}$	5. $\begin{array}{r} 4.9 \\ -0.8 \\ \hline 4.1 \end{array}$
6. $\begin{array}{r} 57.4 \\ -26.1 \\ \hline 31.3 \end{array}$	7. $\begin{array}{r} 69.2 \\ -17.0 \\ \hline 52.2 \end{array}$	8. $\begin{array}{r} 358.6 \\ -126.4 \\ \hline 232.2 \end{array}$	9. $\begin{array}{r} 827.9 \\ -205.3 \\ \hline 622.6 \end{array}$	10. $\begin{array}{r} 7534.2 \\ -6113.0 \\ \hline 1421.2 \end{array}$
11. $\begin{array}{r} 1.9 \\ -1.2 \\ \hline 0.7 \end{array}$	12. $\begin{array}{r} 27.8 \\ -17.5 \\ \hline 10.3 \end{array}$	13. $\begin{array}{r} 342.7 \\ -110.5 \\ \hline 232.2 \end{array}$		
14. $\begin{array}{r} 6.2 \\ -1.7 \\ \hline 4.5 \end{array}$	15. $\begin{array}{r} 5.7 \\ -2.9 \\ \hline 2.8 \end{array}$	16. $\begin{array}{r} 7.3 \\ -2.8 \\ \hline 4.5 \end{array}$	17. $\begin{array}{r} 38.5 \\ -14.9 \\ \hline 23.6 \end{array}$	18. $\begin{array}{r} 78.4 \\ -19.0 \\ \hline 59.4 \end{array}$
19. $\begin{array}{r} 7.8 \\ -0.3 \\ \hline 7.5 \end{array}$	20. $\begin{array}{r} 45.9 \\ -2.3 \\ \hline 43.6 \end{array}$	21. $\begin{array}{r} 92.8 \\ -7.1 \\ \hline 85.7 \end{array}$	22. $\begin{array}{r} 347.0 \\ -15.9 \\ \hline 331.1 \end{array}$	23. $\begin{array}{r} 489.2 \\ -12.7 \\ \hline 476.5 \end{array}$
24. $\begin{array}{r} 248.7 \\ -3.9 \\ \hline 244.8 \end{array}$	25. $\begin{array}{r} 4703.8 \\ -120.8 \\ \hline 4583.0 \end{array}$	26. $\begin{array}{r} 5158.4 \\ -38.7 \\ \hline 5119.7 \end{array}$	27. $\begin{array}{r} 9427.3 \\ -29.0 \\ \hline 9398.3 \end{array}$	28. $\begin{array}{r} 2138.5 \\ -3.9 \\ \hline 2134.6 \end{array}$

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### Using the Exercises

- Questions 1 to 13 do not involve any regrouping. Hence, the students can concentrate on proper number and decimal point alignment. For students having difficulty in this regard, have them use graph paper for their work.
- Questions 14-28 involve properly aligning the numbers as well as regrouping.

## PRACTICE

Find the difference.

1.  $89.2 - 6.6 = 82.6$
2.  $70.8 - 44.8 = 26.0$
3.  $637.4 - 128.2 = 509.2$
4.  $539.0 - 427.8 = 111.2$
5.  $481.7 - 452.5 = 29.2$
6.  $68.4 - 30.7 = 37.7$
7.  $92.6 - 57.9 = 34.7$
8.  $41.3 - 21.5 = 19.8$
9.  $319.4 - 281.7 = 37.7$
10.  $4082.6 - 1539.7 = 2542.9$
11.  $6375.0 - 4109.8 = 2265.2$
12.  $9251.3 - 4781.6 = 4469.7$
13.  $3000.1 - 1231.4 = 1768.7$

Solve.

14. In the 1980 Winter Olympics, the winner of the Big Hill Ski Jump had scores of 114.5 and 117.0. What was the difference in his two scores?  $2.5$
15. In a recent Big Hill Ski Jump, the winner had a total score of 234.8. The person who was second had a total score of 232.9. How many more points did the winner have?  $1.9$

## Let's Make Magic

The square on the left is a Magic Square. Find the magic sum and complete the square.

1.8	3.9	2.4
3.3	2.7	2.1
3.0	1.5	3.6

Add 2.6 to each number.

4.4	6.5	5.0
5.9	5.3	4.7
5.6	4.1	6.2

Add 2.6 to each of its numbers to make a second square. Is the second square a Magic Square? Could you have added any other number to make a new Magic Square?

159

## Extra Practice

Subtract.

1.  $5.3 - 0.6 = 4.7$
2.  $7.4 - 2.8 = 4.6$
3.  $34.2 - 0.5 = 33.7$
4.  $69.7 - 2.4 = 67.3$
5.  $605.8 - 41.7 = 564.1$
6.  $80.0 - 64.3 = 15.7$
7.  $707.6 - 428.8 = 278.8$
8.  $300.5 - 27.3 = 273.2$
9.  $4.7 - 0.9 = 3.8$
10.  $304.0 - 22.5 = 281.5$
11.  $190.2 - 99.8 = 90.4$

Solve.

12. Anne cut a piece 2.8 m long from a plank 5.3 m long. How much of the original plank was left?  $2.5 \text{ m}$
13. Willis ran 400 m in 57.5 seconds. Joe ran the same distance in 61.3 seconds. How much longer did it take Joe to run the distance?  $3.8 \text{ seconds}$

## Assigning the Practice

Minimum: 1-14

Average: 1-15

Enriched: 1-15

## Reinforcement

1. Give small groups of students a 19 cm length of red yarn and a 25 cm length of blue yarn and a pair of scissors. Ask them to cut a 10.5 cm piece from the red yarn and a 14.8 cm piece from the blue yarn. Have them measure how much of each kind of yarn is left and write a corresponding subtraction. Let the students discover the need for *annexing* a zero.

$$19 - 10.5 \text{ or } \begin{array}{r} 19.0 \\ -10.5 \\ \hline \end{array} \quad 25 - 14.8 \text{ or } \begin{array}{r} 25.0 \\ -14.8 \\ \hline \end{array}$$

2. Have the students cut out the following subtraction puzzle, mix the pieces, and put it together again. Solutions can be glued to stiff paper.

$12.0 - 5.2$ 6.8	$17 - 5.5$ 11.5	$15 - 2.3$ 12.7	$15.0 - 1.9$ 13.1
$18 - 3.4$ 14.6	$16 - 2.7$ 13.3	$14.0 - 3.7$ 10.3	$19.0 - 6.9$ 12.1

3. Make two dice. Put the numbers from 0 to 5 on one and the numbers from 4 to 9 on the other. Two people play. The first player rolls the dice and makes the largest number (with ones and tenths) possible. The second player repeats the procedure. The players subtract the smaller number from the larger to find the number of points awarded the high roller. After five throws the person with the largest total wins the game.

## Enrichment

1. Assign *Let's Make Magic* at the bottom of page 159. Encourage the students to make other magic squares by either adding or subtracting a decimal with ones and tenths to all of the numbers in the square.

2. List the following on the chalkboard. Have the students think of as many addition or subtraction names for each as they can in five minutes.

6.2	1.4
$5.6 + 0.6$	$0.7 + 0.7$
$10.4 - 4.2$	$3.8 - 2.4$

# UNIT 7 LESSON 10

## Objective PS7

Solve problems involving the addition and subtraction of decimals.

## Introducing the Lesson

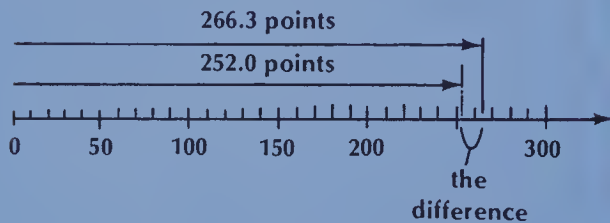
Write the following facts on the chalkboard. Have the students use the facts as they devise word problems. Record their problems on the chalkboard.

4.5 m	25.6°C	44.8 L
6.8 m	41.2°C	48.4 L
18.5 km	2.2 kg	36.4 cm
20.1 km	9.0 kg	91.8 cm

Note the various situations in which one must add or subtract tenths in everyday life.

## Teaching the Lesson

Read and discuss the problem at the top of page 160. List the facts on the chalkboard. Make a sketch to illustrate these facts and to help the students decide on the appropriate action.

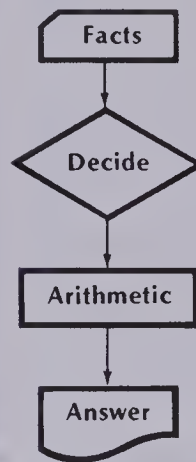


Show the part on the number line which represents the difference between the two amounts of points so that the students can see that subtraction is required when you are looking for *how many more*. Complete the remaining problem solving steps.

Have the students use the problem solving steps to solve the problems they made up earlier in the lesson. Students can work with partners and compare strategies and answers. Discuss all solutions when everyone is finished.

## Problem Solving with Decimals

In 1976, the Olympic Small Hill Ski Jump winner had 252.0 points. In 1980, the winner had 266.3 points. How many more points did the 1980 winner have?

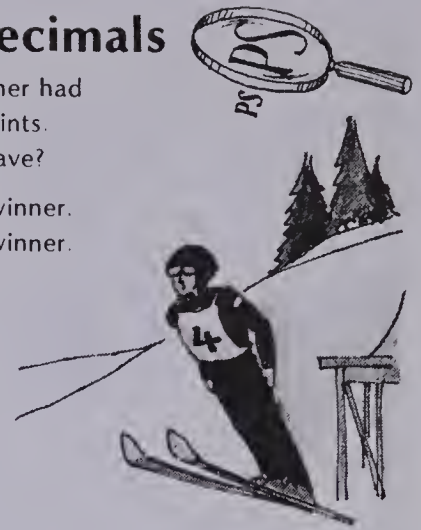


252.0 points for the 1976 winner.  
266.3 points for the 1980 winner.

To find **how many more**, we should **subtract**.

$$\begin{array}{r} 266.3 \\ - 252.0 \\ \hline 14.3 \end{array}$$

The 1980 winner had 14.3 more points.



## EXERCISES

Solve these problems.

1. In an Olympic figure skating competition, Lynn Nightingale of Canada scored 181.7 points. Kim Alletson scored 171.6 points. What was the difference in their scores? **10.1**
2. In a men's figure skating competition, Toller Cranston scored 187.4 points. Stan Bohonek scored 165.9 points. How many more points did Toller Cranston get? **21.5**
3. In a Speed Skating competition, Gaetan Boucher of Canada came in second with a time of 1 minute 16.7 seconds. The winner's time was 1 minute 15.2 seconds. What was the difference in their scores? **1.5 seconds**

## Using the Exercises

- Discuss the facts about Winter Olympic competitors at the bottom of page 160. Encourage the students to use the suggested problem solving steps for their work.

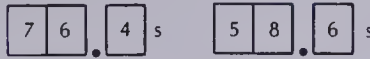


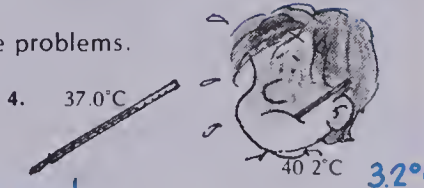
## PRACTICE

Solve.

- In 1980, Eric Heiden won the 10 000 m Speed Skating competition. His time was 14 minutes 28.1 seconds. The previous world record was 14 minutes 34.3 seconds. By how much did Heiden break the world record? **6.2 seconds**
- To reach the Lake Placid Winter Olympics from Windsor, Mr. Allen filled up the tank with gas three times. The first time he put in 65.3 L, the second time 60.4 L, and the third time 50.2 L. How much gas did he buy? **175.9 L**

Use the facts in the pictures to solve the problems.

- 

Find the difference in time. **17.8 seconds**
- 

How high above normal? **3.2°C**

## REVIEW

	Write as fractions.	Write as decimals.
N12	1. 0.7 <b><math>\frac{7}{10}</math></b>	2. 0.3 <b><math>\frac{3}{10}</math></b>
	3. $\frac{4}{10}$ <b>0.4</b>	4. $\frac{8}{10}$ <b>0.8</b>
	Write as fractions.	Write as decimals.
N13	5. 1.3 <b><math>\frac{13}{10}</math></b>	6. 1.6 <b><math>\frac{16}{10}</math></b>
	7. $\frac{15}{10}$ <b>1.5</b>	8. $\frac{12}{10}$ <b>1.2</b>
	Add.	
A36	9. $\begin{array}{r} 0.4 \\ + 0.2 \\ \hline 0.6 \end{array}$	10. $\begin{array}{r} 1.7 \\ + 3.2 \\ \hline 4.9 \end{array}$
	11. $\begin{array}{r} 7.9 \\ + 1.3 \\ \hline 9.2 \end{array}$	12. $\begin{array}{r} 27.5 \\ + 8.7 \\ \hline 36.2 \end{array}$
	13. $\begin{array}{r} 348.4 \\ + 209.6 \\ \hline 558.0 \end{array}$	
	Subtract.	
A37	14. $\begin{array}{r} 0.9 \\ - 0.3 \\ \hline 0.6 \end{array}$	15. $\begin{array}{r} 3.7 \\ - 2.5 \\ \hline 1.2 \end{array}$
	16. $\begin{array}{r} 69.2 \\ - 16.8 \\ \hline 52.4 \end{array}$	17. $\begin{array}{r} 45.8 \\ - 7.2 \\ \hline 38.6 \end{array}$
	18. $\begin{array}{r} 487.4 \\ - 139.7 \\ \hline 347.7 \end{array}$	

161

## Assigning the Practice

Minimum: 1-4

Average: 1-4

Enriched: 1-4

## Review Exercises

Questions	Objective	Pages
1-4	N12	150-151
5-8	N13	152-153
9-13	A36	156-157
14-18	A37	158-159

## Reinforcement

- Ask the students to place a decimal point in the following amounts to make the statements reasonable.
  - Joan is 15 m tall.
  - A local phone call costs \$20.
  - Mr. Perry put 578 L of gas into his car.
  - It took George forty minutes to walk to the bridge which is 15 km away.
  - A book costs \$4.95. Nina gave the clerk \$5.00 and received \$5 change.
  - A centimetre is equal to 1 decimetre.
  - Larry had a fever of 392°C.
  - Twenty-one nickels is \$105.
- Have available sports magazines and books with Olympic records. Ask the students to list types of records that are in tenths.

## Enrichment

- Have the students use the Olympic records information (mentioned above) to devise word problems. Write their problems on a worksheet for the class to solve.
- Give the students square centimetre graph paper and rulers. Ask them to draw the following rectangles as exactly as possible and then to find the perimeters.

	length	width
1.	3.5 cm	2.5 cm
2.	8.5 cm	1.5 cm
3.	6.5 cm	6.2 cm
4.	15.4 cm	9.6 cm
5.	12.5 cm	10.8 cm

## Problem Solving Activities

Assign Level 4, Unit 6

## Extra Practice

## Worksheet PS7

Pages 160-161

Solve.

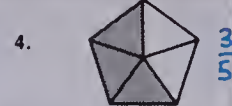
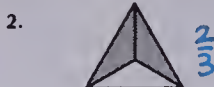
- In 1948, the Men's Freestyle Swimming Olympic record was 57.3 seconds. In 1968, it was 52.2 seconds. By how much did the time improve? **5.1 seconds**
- In 1948, the Women's 200 Metre Dash Olympic record was 24.4 seconds. In 1972, it was 22.4 seconds. What was the difference in time? **2.0 seconds**
- The price of regular gas increased by 4.2¢ a litre. If it was 45.5¢ a litre before the increase, find the new price. **49.7¢**
- John had a 3.5 m and 4.8 m piece of string. Does he have enough for an 8 m kite string? **yes**
- On Monday, Jane's bean plant was 11.2 cm tall. It grew 6.5 cm in the next five days. How tall is it now? **17.7 cm**

Unit 7 Objective	Test Question	Pages
N8	1-4	142-143
N9	7-10	144-145
N10	11-14	146-147
N11	5-6	148-149
N12	15-19	150-151
N13	20-21	152-153
M12	22-24	154-155
A36	25-26	156-157
A37	27-29	158-159
PS	30	

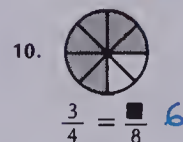
# TEST

# UNIT 7

What fraction of the whole is shaded?



Complete the fraction.



Use < or > to make a true statement.

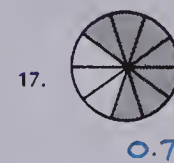
11.  $\frac{1}{4} \blacksquare \frac{3}{4}$   $\frac{1}{4} < \frac{3}{4}$

12.  $\frac{2}{3} \blacksquare \frac{1}{3}$   $\frac{2}{3} > \frac{1}{3}$

13.  $\frac{3}{5} \blacksquare \frac{2}{5}$   $\frac{3}{5} > \frac{2}{5}$

14.  $\frac{3}{8} \blacksquare \frac{5}{8}$   $\frac{3}{8} < \frac{5}{8}$

Write the decimal for the shaded part.



Write as a decimal.

18.  $\frac{7}{10}$   $0.7$

19.  $\frac{4}{10}$   $0.4$

20.  $\frac{11}{10}$   $1.1$

21.  $\frac{14}{10}$   $1.4$

Complete.

22. 40 cm =  $\blacksquare$  dm  $\blacksquare = 4$

23. 7 dm =  $\blacksquare$  cm  $\blacksquare = 70$

24. 1 dm =  $\blacksquare$  m  $\blacksquare = 0.1$

Add or subtract.

25.  $\begin{array}{r} 4.8 \\ + 2.5 \\ \hline 7.3 \end{array}$

26.  $\begin{array}{r} 34.7 \\ + 58.8 \\ \hline 93.5 \end{array}$

27.  $\begin{array}{r} 8.7 \\ - 2.4 \\ \hline 6.3 \end{array}$

28.  $\begin{array}{r} 9.3 \\ - 3.6 \\ \hline 5.7 \end{array}$

29.  $\begin{array}{r} 34.2 \\ - 17.2 \\ \hline 17.0 \end{array}$

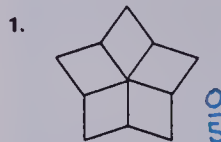
Solve.

30. Heather's skis measure 18.5 dm. Colleen's skis measure 19.2 dm. How much longer are Colleen's skis?  $7\text{cm or }0.7\text{dm}$

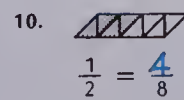
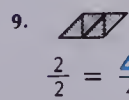
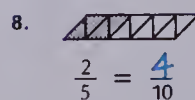
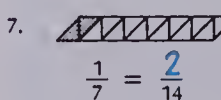
## Post-test

## Unit 7

Write a fraction for the shaded part.



Complete the fraction.



Use < or > to make a true statement.

11.  $\frac{3}{10} \blacksquare \frac{4}{10}$   $\frac{3}{10} < \frac{4}{10}$

12.  $\frac{4}{4} \blacksquare \frac{3}{4}$   $\frac{4}{4} > \frac{3}{4}$

13.  $\frac{6}{9} \blacksquare \frac{5}{9}$   $\frac{6}{9} > \frac{5}{9}$

14.  $\frac{0}{3} \blacksquare \frac{2}{3}$   $\frac{0}{3} < \frac{2}{3}$

DIVISION

Write two division facts for each array.

1. 

\*\*\*\*\*  
\*\*\*\*\*  
\*\*\*\*\*

$15 \div 5 = 3$   
 $15 \div 3 = 5$

2. 

\*\*\*\*\*  
\*\*\*\*\*  
\*\*\*\*\*  
\*\*\*\*\*

$20 \div 5 = 4$   
 $20 \div 4 = 5$

3. 

\*\*\*\*\*  
\*\*\*\*\*  
\*\*\*\*\*

$12 \div 2 = 6$   
 $12 \div 6 = 2$

4. 

\*\*\*\*\*  
\*\*\*\*\*  
\*\*\*\*\*  
\*\*\*\*\*  
\*\*\*\*\*  
\*\*\*\*\*

$42 \div 7 = 6$   
 $42 \div 6 = 7$

Draw an array to illustrate each fact.

5.  $6 \div 3$   

...

6.  $12 \div 6$   

.....

7.  $24 \div 8$   

.....

8.  $30 \div 10$   

.....

9.  $36 \div 6$   

.....

Solve.

10.  $2 \overline{)10}$ 

5

11.  $2 \overline{)16}$ 

8

12.  $2 \overline{)20}$ 

10

13.  $3 \overline{)9}$ 

3

14.  $3 \overline{)18}$ 

6

15.  $5 \overline{)35}$ 

7

16.  $4 \overline{)12}$ 

3

17.  $4 \overline{)24}$ 

6

18.  $4 \overline{)32}$ 

8

19.  $5 \overline{)20}$ 

4

20.  $1 \overline{)7}$ 

7

21.  $1 \overline{)10}$ 

10

22.  $2 \overline{)0}$ 

0

23.  $8 \overline{)0}$ 

0

24.  $10 \overline{)0}$ 

0

25.  $2 \overline{)14}$ 

7

26.  $4 \overline{)36}$ 

9

27.  $5 \overline{)0}$ 

0

28.  $3 \overline{)30}$ 

10

29.  $5 \overline{)25}$ 

5

30.  $6 \overline{)36}$ 

6

31.  $6 \overline{)54}$ 

9

32.  $7 \overline{)21}$ 

3

33.  $7 \overline{)56}$ 

8

34.  $7 \overline{)70}$ 

10

35.  $8 \overline{)24}$ 

3

36.  $8 \overline{)48}$ 

6

37.  $8 \overline{)72}$ 

9

38.  $9 \overline{)27}$ 

3

39.  $9 \overline{)45}$ 

5

40.  $10 \overline{)50}$ 

5

41.  $10 \overline{)20}$ 

2

42.  $10 \overline{)60}$ 

6

43.  $10 \overline{)90}$ 

9

44.  $10 \overline{)70}$ 

7

45.  $9 \overline{)72}$ 

8

46.  $7 \overline{)49}$ 

7

47.  $10 \overline{)100}$ 

10

48.  $8 \overline{)64}$ 

8

49.  $5 \overline{)0}$ 

0

How many weeks?

50. 42 days  
6 weeks

51. 28 days  
4 weeks

52. 0 days  
0 weeks

53. 63 days  
9 weeks

Write a decimal for the shaded part.

15. 

.....

0.1

16. 

.....

0.5

17. 

.....

0.8

Write as a decimal.

18.  $\frac{6}{10} = 0.6$

19.  $\frac{1}{10} = 0.1$

20.  $\frac{14}{10} = 1.4$

21.  $\frac{11}{10} = 1.1$

Complete.

22. 30 cm = 3 dm

23. 6 dm = 60 cm

24. 5 dm = 0.5 m

Add or subtract.

25.  $2.6 + 9.4 = 12.0$

26.  $18.7 + 5.8 = 24.5$

27.  $4.5 - 2.9 = 1.6$

28.  $60.4 - 0.8 = 59.6$

29.  $23.7 - 7.9 = 15.8$

Solve.

30. How much less is a 5.2 kg basket of apples than a 7 kg basket of apples?  
1.8 kg



# UNIT 8

## Multiplication of Whole Numbers

Theme: Supermarkets

Lesson		Objective	Pages
Preview		Review multiplication facts to $10 \times 10$ .	165
1	A38	Multiply a multiple of 10 by a one-digit number.	166-167
2	A39	Multiply the sum of two numbers by a one-digit number (distributive property).	168-169
3	A40	Multiply a two-digit number by a one-digit number, with no regrouping.	170-171
4	A41	Multiply a two-digit number by a one-digit number, with regrouping of ones.	172-173
5	A42	Multiply a multiple of 100 by a one-digit number; estimate products using multiples of 10 or 100.	174-175
6	A43	Multiply a three-digit number by a one-digit number, with regrouping of ones.	176-177
7	A44	Multiply a three-digit number by a one-digit number, with regrouping of ones and tens.	178-179
8	A45	Multiply three factors (associative property).	180-181
9	PS8	Solve problems with multiplication or division.	182-183
10	M13	Use estimation in measurement problems.	184-185
Test		Multiplication of Whole Numbers	186
Review		Fractions and Decimals	187

# About This Unit

The aim of this unit is to develop skills in multiplying a two- or three-digit number by a one-digit number, thereby establishing the foundation for the multiplication algorithm. Two properties of whole numbers, the distributive property and the associative property of multiplication, are examined and discussed, although not by name. Problem-solving skills and the use of estimation in measurement problems are developed as well.

Whenever possible, concrete materials, or place-value blocks, should be used to illustrate the problem situation in the lesson example. It is important for the students to understand and learn the multiplication algorithm. If students show weakness in the basic facts to  $10 \times 10$ , let them use a multiplication table as a temporary crutch, so that the emphasis in this unit can be on the algorithm. The instructional strategy in the unit is to develop the multiplication algorithm, step by step, so that it becomes firmly established. Each lesson is built on a lesson example that illustrates a particular step. The exercises are set up to aid in the learning process: the problems in each row are sequential, and the rows themselves are arranged in order of conceptual difficulty.

# Ideas

The theme of this unit is *Supermarkets*. For a class project, set up a store in the classroom. Students cooperate by bringing items from home (preferably empty containers that can be repaired to look unopened). They can organize the items in the store.

Students take turns being the cashier, stock taker, customer, etc. If possible, arrange a field trip to a grocery store asking the manager to take the children on a tour, including the stock rooms, shipping and receiving, etc.

To add interest, students might enjoy using calculators during part of the time they are playing the roles of cashier or stock taker or customer.

Give a short quiz each day on the previous day's work throughout all of Unit 8. Drill is essential because one concept builds upon the previous one. Students can record their quiz results in bar graph form. Daily quizzes provide information to both student and teacher.

# UNIT 8

## MULTIPLICATION



Unit 8 Objectives	Test Questions	Pages
A38	1-5	166-167
A39	6-9	168-169
A40	10-14	170-171
A41	15-19	172-173
A42	20-29	174-175
A43	30-34	176-177
A44	35-39	178-179
A45	40-43	180-181
M13	44	184-185

### Pretest

Compute.

$$\begin{array}{r} 1. \quad 30 \\ \times 4 \\ \hline 120 \end{array}$$

$$\begin{array}{r} 2. \quad 20 \\ \times 6 \\ \hline 120 \end{array}$$

$$\begin{array}{r} 3. \quad 80 \\ \times 7 \\ \hline 560 \end{array}$$

$$\begin{array}{r} 4. \quad 70 \\ \times 5 \\ \hline 350 \end{array}$$

$$\begin{array}{r} 5. \quad 90 \\ \times 6 \\ \hline 540 \end{array}$$

$$6. \quad 4 \times (5 + 3) = \underline{32}$$

$$7. \quad 8 \times (2 + 6) = \underline{64}$$

$$8. \quad 6 \times (10 + 4) = \underline{84}$$

$$9. \quad 5 \times (40 + 30) = \underline{350}$$

$$\begin{array}{r} 10. \quad 24 \\ \times 2 \\ \hline 48 \end{array}$$

$$\begin{array}{r} 11. \quad 52 \\ \times 4 \\ \hline 208 \end{array}$$

$$\begin{array}{r} 12. \quad 73 \\ \times 3 \\ \hline 219 \end{array}$$

$$\begin{array}{r} 13. \quad 91 \\ \times 8 \\ \hline 728 \end{array}$$

$$\begin{array}{r} 14. \quad 62 \\ \times 3 \\ \hline 186 \end{array}$$

$$\begin{array}{r} 15. \quad 57 \\ \times 3 \\ \hline 171 \end{array}$$

$$\begin{array}{r} 16. \quad 26 \\ \times 4 \\ \hline 104 \end{array}$$

$$\begin{array}{r} 17. \quad 63 \\ \times 5 \\ \hline 315 \end{array}$$

$$\begin{array}{r} 18. \quad 29 \\ \times 6 \\ \hline 174 \end{array}$$

$$\begin{array}{r} 19. \quad 75 \\ \times 8 \\ \hline 600 \end{array}$$

$$\begin{array}{r} 20. \quad 300 \\ \times 3 \\ \hline 900 \end{array}$$

$$\begin{array}{r} 21. \quad 500 \\ \times 7 \\ \hline 3500 \end{array}$$

$$\begin{array}{r} 22. \quad 200 \\ \times 9 \\ \hline 1800 \end{array}$$

$$\begin{array}{r} 23. \quad 800 \\ \times 5 \\ \hline 4000 \end{array}$$

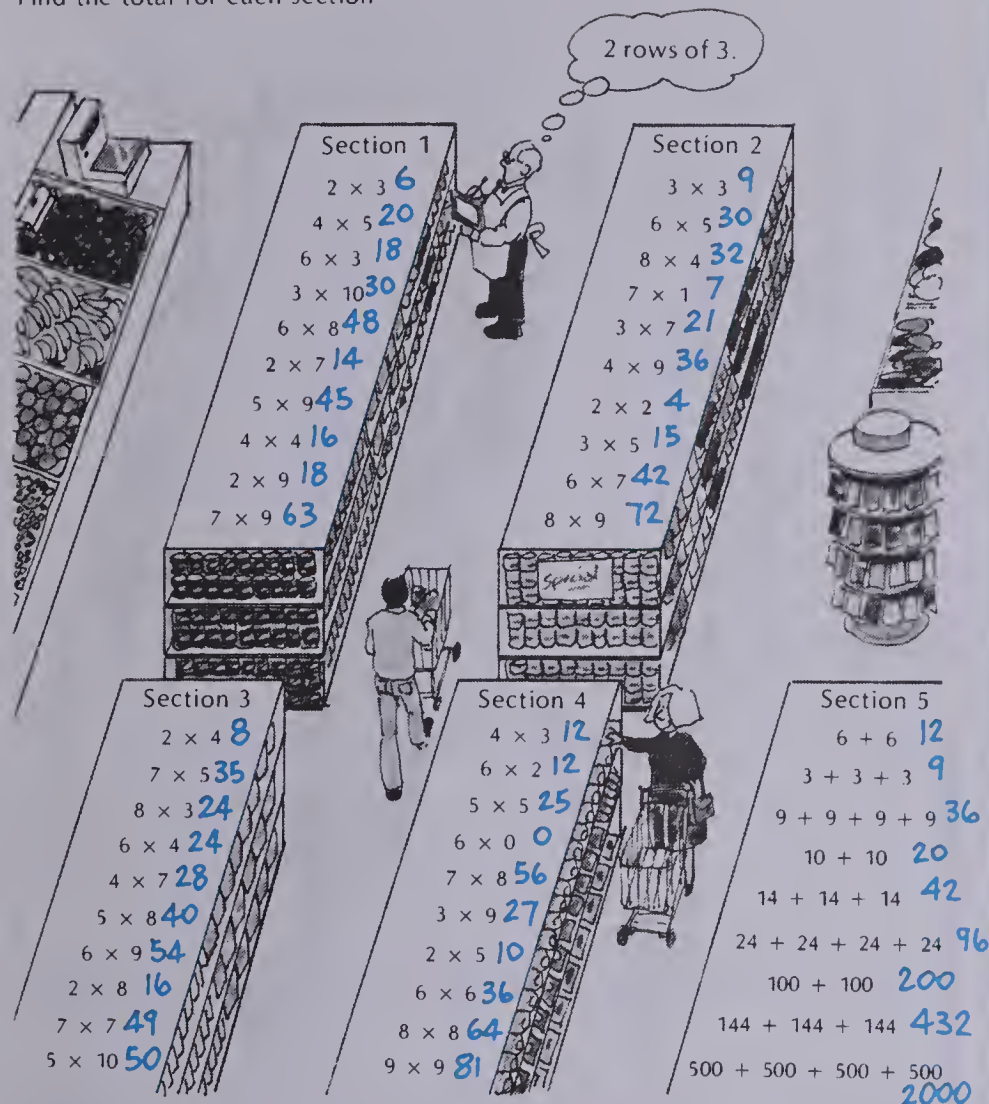
$$\begin{array}{r} 24. \quad 900 \\ \times 6 \\ \hline 5400 \end{array}$$

### Unit 8



# Supermarket Stock

Find the total for each section



What is the total of all the sections?

$$278 + 268 + 328 + 323 + 2847 = 4044$$

165

## UNIT 8

## PREVIEW

### Suggestions

Begin a discussion of the unit theme, supermarkets. Ask the students how multiplication might be used in a supermarket or grocery store (in determining the number of items packed in boxes or cartons, in stocking items on shelves, in finding the price of several items that have the same unit price, etc.). You might visit a supermarket as a class to call the students' attention to multiplication in retailing. Call the manager and ask for a guided tour. The manager may show you the behind-the-scenes operation of unpacking and point out other items of interest, such as how price tags are put on items and how unit prices (cost per millilitre or per gram) are determined. He or she may ask a cashier to demonstrate the cash register. The store may have electronic devices that "read" codes on labels or scales that automatically give the total price of produce when the unit price is entered. The manager will be glad to explain these to the students.

### About the Page

Ask the students if they know what "taking stock" in a store is. Tell them that they are going to help the store manager on page 165 to take stock by doing the multiplication exercises shown there. Have the students jot down the answers for each section and then add them on a calculator. If everyone agrees with the total, the individual answers are no doubt correct. If students have made errors, do some basic drill of multiplication facts before proceeding to the rest of the unit.

### Reinforcement

1. Use the Reviews on pages 103 and 113 of Unit 5 to determine the areas of weakness in multiplication facts for each student. Assign appropriate Extra Practice sections for students who need them.

2. Have the students work in pairs to drill each other in the multiplication facts using flash cards.

Round the first number Estimate the answer

25. $\begin{array}{r} 42 \\ \times 6 \\ \hline 240 \end{array}$	26. $\begin{array}{r} 79 \\ \times 9 \\ \hline 720 \end{array}$	27. $\begin{array}{r} 18 \\ \times 5 \\ \hline 100 \end{array}$	28. $\begin{array}{r} 247 \\ \times 2 \\ \hline 400 \end{array}$	29. $\begin{array}{r} 713 \\ \times 3 \\ \hline 2100 \end{array}$
---	---	---	--	---

Multiply.

30. $\begin{array}{r} 218 \\ \times 3 \\ \hline 654 \end{array}$	31. $\begin{array}{r} 425 \\ \times 2 \\ \hline 850 \end{array}$	32. $\begin{array}{r} 624 \\ \times 3 \\ \hline 1872 \end{array}$	33. $\begin{array}{r} 917 \\ \times 5 \\ \hline 4585 \end{array}$	34. $\begin{array}{r} 836 \\ \times 2 \\ \hline 1672 \end{array}$
--	--	---	---	---

35. $\begin{array}{r} 254 \\ \times 6 \\ \hline 1524 \end{array}$	36. $\begin{array}{r} 435 \\ \times 5 \\ \hline 2175 \end{array}$	37. $\begin{array}{r} 846 \\ \times 3 \\ \hline 2538 \end{array}$	38. $\begin{array}{r} 752 \\ \times 8 \\ \hline 6016 \end{array}$	39. $\begin{array}{r} 564 \\ \times 4 \\ \hline 2256 \end{array}$
---	---	---	---	---

40.  $4 \times 5 \times 2 = 40$

42.  $2 \times 6 \times 2 = 24$

44. Each of the 5 members of a team can collect about 30 bottle caps. There are 6 teams. About how many bottle caps can they collect?  $900$

# UNIT 8 LESSON 1

## Objective A38

Multiply a multiple of 10 by a one-digit number.

## Introducing the Lesson

Ask the students for suggestions of items that might come in packages of 10 (garbage bags, candy bars, pencils, etc.). Use the suggestions to make up questions about multiples of 10. For example: "Mr. Lerner bought 3 packages of garbage bags. How many bags did he get?" *3 tens is 30.*

Reverse the procedure. "Kathleen bought a package that has 90 Q-tips in it. How many tens is that?" *90 is 9 tens.*

## Teaching the Lesson

Discuss the lesson example on page 166. Illustrate the example with place-value blocks.



$$4 \text{ tens} + 4 \text{ tens} + 4 \text{ tens} = 12 \text{ tens}$$

$$3 \times 4 \text{ tens} = 12 \text{ tens}$$

Point out that, although in this example repeated addition is simple, in other problems it may be much easier to use multiplication. Write the following set on the chalkboard and discuss the answers with the students.

$$4 \times 6 \text{ ones} = \begin{array}{r} 6 \\ \times 4 \\ \hline \end{array} \quad \begin{array}{r} 60 \\ \times 4 \\ \hline \end{array}$$

$$4 \times 6 \text{ tens} =$$

Do several other similar examples together.

## Multiples of 10

Sam went to the store and bought 3 small bags of peanuts. When he got home he counted the peanuts in one bag. There were 40 peanuts. About how many peanuts did Sam get in all 3 bags?

To solve the problem, you could add.

$$40 + 40 + 40 = 120$$

Or, you could multiply.

Write the question

$$\begin{array}{r} 40 \\ \times 3 \\ \hline \end{array}$$

Think.

$$3 \times 4 \text{ tens} = 12 \text{ tens}$$

$$\begin{array}{r} 40 \\ \times 3 \\ \hline 120 \end{array}$$

Sam got about 120 peanuts in the 3 bags.

## EXERCISES

Multiply.

$$\begin{array}{r} 1. \quad 3 \\ \times 2 \\ \hline 6 \end{array}$$

$$\begin{array}{r} 2. \quad 30 \\ \times 2 \\ \hline 60 \end{array}$$

$$\begin{array}{r} 3. \quad 20 \\ \times 2 \\ \hline 40 \end{array}$$

$$\begin{array}{r} 4. \quad 40 \\ \times 2 \\ \hline 80 \end{array}$$

$$\begin{array}{r} 5. \quad 30 \\ \times 3 \\ \hline 90 \end{array}$$

$$\begin{array}{r} 6. \quad 5 \\ \times 3 \\ \hline 15 \end{array}$$

$$\begin{array}{r} 7. \quad 50 \\ \times 3 \\ \hline 150 \end{array}$$

$$\begin{array}{r} 8. \quad 70 \\ \times 3 \\ \hline 210 \end{array}$$

$$\begin{array}{r} 9. \quad 80 \\ \times 3 \\ \hline 240 \end{array}$$

$$\begin{array}{r} 10. \quad 50 \\ \times 2 \\ \hline 100 \end{array}$$

$$\begin{array}{r} 11. \quad 6 \\ \times 7 \\ \hline 42 \end{array}$$

$$\begin{array}{r} 12. \quad 60 \\ \times 7 \\ \hline 420 \end{array}$$

$$\begin{array}{r} 13. \quad 70 \\ \times 7 \\ \hline 490 \end{array}$$

$$\begin{array}{r} 14. \quad 90 \\ \times 7 \\ \hline 630 \end{array}$$

$$\begin{array}{r} 15. \quad 60 \\ \times 8 \\ \hline 480 \end{array}$$

166

## Using the Exercises

- The first example in each row identifies a basic fact for the students before they complete the row.
- Ask the students to read the problems orally, interpreting the multiplication according to the place value of the non-zero digit.

(For example, read  $\begin{array}{r} 3 \\ \times 2 \\ \hline \end{array}$  as "2 times 3 ones", and  $\begin{array}{r} 30 \\ \times 2 \\ \hline \end{array}$  as "2 times

$$\begin{array}{r} 3 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 30 \\ \times 2 \\ \hline \end{array}$$

3 tens".) Ask the students to give the answers two ways. (6 ones, or 6. 6 tens, or 60.)

## PRACTICE

Multiply.

- |   |   |   |   |   |
|---|---|---|---|---|
| 1. $\begin{array}{r} 30 \\ \times 2 \\ \hline 60 \end{array}$   | 2. $\begin{array}{r} 10 \\ \times 4 \\ \hline 40 \end{array}$   | 3. $\begin{array}{r} 20 \\ \times 3 \\ \hline 60 \end{array}$   | 4. $\begin{array}{r} 40 \\ \times 2 \\ \hline 80 \end{array}$   | 5. $\begin{array}{r} 30 \\ \times 3 \\ \hline 90 \end{array}$   |
| 6. $\begin{array}{r} 30 \\ \times 4 \\ \hline 120 \end{array}$  | 7. $\begin{array}{r} 40 \\ \times 3 \\ \hline 120 \end{array}$  | 8. $\begin{array}{r} 20 \\ \times 5 \\ \hline 100 \end{array}$  | 9. $\begin{array}{r} 50 \\ \times 4 \\ \hline 200 \end{array}$  | 10. $\begin{array}{r} 60 \\ \times 4 \\ \hline 240 \end{array}$ |
| 11. $\begin{array}{r} 40 \\ \times 7 \\ \hline 280 \end{array}$ | 12. $\begin{array}{r} 50 \\ \times 8 \\ \hline 400 \end{array}$ | 13. $\begin{array}{r} 20 \\ \times 9 \\ \hline 180 \end{array}$ | 14. $\begin{array}{r} 60 \\ \times 6 \\ \hline 360 \end{array}$ | 15. $\begin{array}{r} 30 \\ \times 7 \\ \hline 210 \end{array}$ |
| 16. $\begin{array}{r} 60 \\ \times 7 \\ \hline 420 \end{array}$ | 17. $\begin{array}{r} 80 \\ \times 8 \\ \hline 640 \end{array}$ | 18. $\begin{array}{r} 70 \\ \times 9 \\ \hline 630 \end{array}$ | 19. $\begin{array}{r} 90 \\ \times 8 \\ \hline 720 \end{array}$ | 20. $\begin{array}{r} 80 \\ \times 7 \\ \hline 560 \end{array}$ |

Solve.

21. Mrs. Turner bought 3 boxes of tea. Each box contained 50 tea bags. How many tea bags were there altogether? **150**
22. There are 6 check-out counters at Dodd's Market. Each counter is supplied with 30 copies of *Pets and People* magazine. How many copies should the manager order? **180**
23. A small box of raisins costs 30¢. Each of the 3 Ryan children want raisins. How much money does Mrs. Ryan need for the raisins? **90¢**

## Consumer Problem

A supermarket pays a 60¢ refund for plastic milk bottles.

How much should you get for 5 bottles?

**\$3.00**

167

## Assigning the Practice

Minimum: 1-15, 21

Average: 1-22

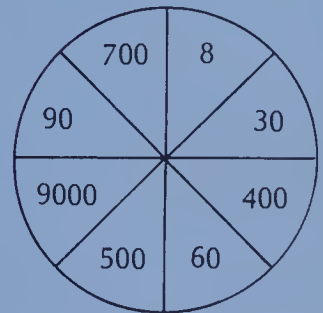
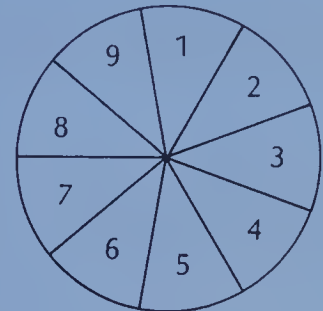
Enriched: 11-23

## Reinforcement

Assign *Consumer Problem* at the bottom of page 167.

## Enrichment

Have the students play a game in small groups. Provide 2 spinners for each group.



A player spins both spinners and gives the product of the two numbers.

## Extra Practice

## Worksheet A38

Pages 166 - 167

Multiply.

- |  |  |  |  |   |
|--|--|--|--|---|
| 1. $\begin{array}{r} 20 \\ \times 6 \\ \hline 120 \end{array}$ | 2. $\begin{array}{r} 40 \\ \times 5 \\ \hline 200 \end{array}$ | 3. $\begin{array}{r} 30 \\ \times 8 \\ \hline 240 \end{array}$ | 4. $\begin{array}{r} 50 \\ \times 5 \\ \hline 250 \end{array}$ | 5. $\begin{array}{r} 70 \\ \times 6 \\ \hline 420 \end{array}$  |
| 6. $\begin{array}{r} 60 \\ \times 7 \\ \hline 420 \end{array}$ | 7. $\begin{array}{r} 40 \\ \times 9 \\ \hline 360 \end{array}$ | 8. $\begin{array}{r} 70 \\ \times 8 \\ \hline 560 \end{array}$ | 9. $\begin{array}{r} 90 \\ \times 6 \\ \hline 540 \end{array}$ | 10. $\begin{array}{r} 90 \\ \times 3 \\ \hline 270 \end{array}$ |
| 11. $9 \times 80 = 720$  | 12. $7 \times 9 \text{ tens} = 63 \text{ tens}$                | 13. $8 \times 40 = 320$  |  |   |

Solve

14. There are 50 gum drops in one package. How many gum drops are there in 4 packages? **200**



# UNIT 8 LESSON 2

## Objective A39

Multiply the sum of two numbers by a one-digit number (distributive property).

## Introducing the Lesson

Review the expanded form for two-digit numbers.

$$\begin{array}{ll} 68 = 60 + 8 & 27 = 20 + 7 \\ 93 = 90 + 3 & 45 = 40 + 5 \end{array}$$

This step may seem very elementary at this point, but it is needed in the development of the multiplication algorithm.

## Teaching the Lesson

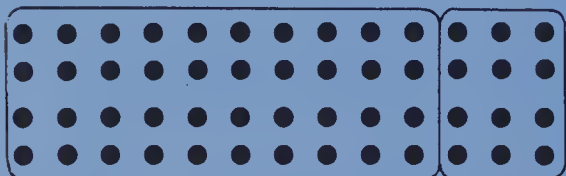
Read the lesson example on page 168 together. Make sure that the students understand the expression  $2 \times (4 + 3)$  in terms of the cereal boxes on the shelf. Then draw an array in two colours on the chalkboard to represent the problem.



Ask for different ways to express what is shown. The students might include:

$$\begin{array}{ll} 2 \times 7 & 2 \times (4 + 3) \\ 7 \times 2 & 2 \text{ fours and } 2 \text{ threes} \end{array}$$

Then draw a  $13 \times 4$  array on the chalkboard. Ask the students for an expression of how many dots there are. They will probably respond  $4 \times 13$  or  $13 \times 4$ . Draw a line as shown below and tell the students that when one of the numbers is above 10, it is easy to find the total number by separating the number into two parts: ten and the ones left over.



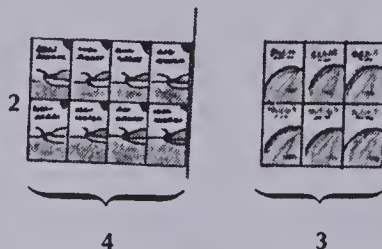
$$\begin{array}{ll} 4 \times 13 = 4 \times (10 + 3) & \text{or} & 4 \times 10 = 40 \\ & & 4 \times 3 = 12 \\ & & \hline & & 52 \end{array}$$

## Multiplication and Addition

Jane was putting cereal boxes on the shelves at the supermarket.

She placed 4 boxes of Great Grain and 3 boxes of Half Bran in a layer. The manager asked for another layer.

How many boxes will there be in all?



Add and then multiply.

$$2 \times (4 + 3) = 2 \times 7 = 14$$

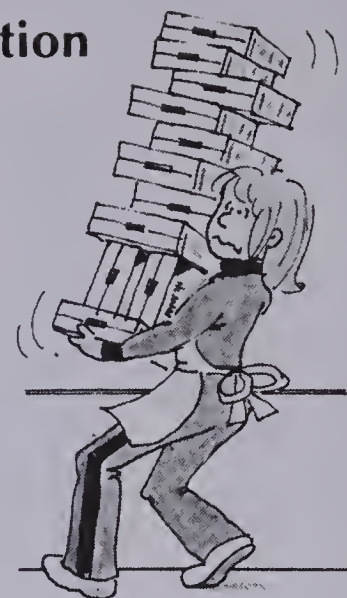
OR

Multiply and then add.

$$2 \times 4 = 8$$

$$2 \times 3 = 6$$

$$\hline 14$$



## EXERCISES

Compute.

- |                             |                             |                             |
|-----------------------------|-----------------------------|-----------------------------|
| 1. $6 \times 7$ 42          | 2. $6 \times (4 + 3)$ 42    | 3. $6 \times (5 + 2)$ 42    |
| 4. $9 \times 8$ 72          | 5. $9 \times (4 + 4)$ 72    | 6. $9 \times (1 + 7)$ 72    |
| 7. $7 \times 60$ 420        | 8. $7 \times (30 + 30)$ 420 | 9. $7 \times (50 + 10)$ 420 |
| 10. $7 \times 10$ 70        | 11. $7 \times 6$ 42         | 12. $7 \times (10 + 6)$ 112 |
| 13. $7 \times 16$ 112       | 14. $9 \times 10$ 90        | 15. $9 \times 2$ 18         |
| 16. $9 \times (10 + 2)$ 108 | 17. $9 \times 12$ 108       |                             |

## Using the Exercises

- Make sure that the students see that each of the problems in the first row is an expression of the same problem (" $4 + 3$ " and " $5 + 2$ " are ways to say "7"). Establish the fact,  $6 \times 7 = 42$ , with the first problem as a check of the rules for the other two expressions. Ask the students to work the other problems by multiplying in two parts and then adding. Do the next two rows in the same way.
- Ask the students to come to the chalkboard and show their work (for multiplying in two parts and then adding) for questions 10 to 17. Discuss the various expressions chosen by different students. ( $7 \times (8 + 2)$ ,  $7 \times (9 + 1)$ ,  $7 \times (5 + 5)$ , etc.)

## PRACTICE

Compute.

1.  $8 \times (3 + 2)$  40
2.  $7 \times (4 + 3)$  49
3.  $7 \times (3 + 5)$  56
4.  $5 \times (6 + 3)$  45
5.  $7 \times (4 + 5)$  63
6.  $9 \times (8 + 2)$  90
7.  $8 \times (20 + 10)$  240
8.  $7 \times (40 + 30)$  490
9.  $9 \times (30 + 30)$  540
10.  $6 \times (60 + 20)$  480
11.  $7 \times (30 + 20)$  350
12.  $5 \times (50 + 40)$  450
13.  $8 \times (10 + 5)$  120
14.  $9 \times (10 + 2)$  108
15.  $7 \times (10 + 9)$  133
16.  $6 \times (20 + 3)$  138
17.  $8 \times (30 + 5)$  280
18.  $7 \times (50 + 2)$  364
19.  $9 \times (60 + 5)$  585
20.  $8 \times (20 + 8)$  224
21.  $7 \times (30 + 4)$  238

Solve.

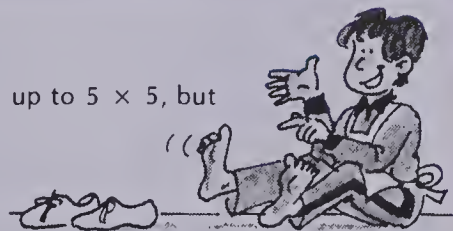
22. Maria and Joe counted the people in the library and the lunchroom. Maria counted 6 tables of 10 in the library. Joe counted 3 tables of 10 in the lunchroom. How many people were there altogether? 90
23. Joan and Sharon counted the teams in a double curling rink. Joan counted 5 teams of 4. Sharon counted 3 teams of 4. How many players were in both rinks? 32
24. In a grocery store there are 10 rows of 7 packages of Bouncy Bubble Gum at one counter. There are 20 rows of 7 packages at another counter. How many packages of the gum are there altogether? 210

## Multiplication Whiz

Ricky only knew his multiplication facts up to  $5 \times 5$ , but he could work out the facts to  $9 \times 9$ .

Show how he could compute  $4 \times 9$ .

Show how he could compute  $8 \times 9$ .



$$5 \times 4 + 4 \times 4 \quad 5 \times 5 + 5 \times 4 + 3 \times 5 + 3 \times 4$$

169

## Assigning the Practice

Minimum: 1-15, 22

Average: 4-23

Enriched: 10-24

## Reinforcement

1. Make a worksheet for the students with problems like the following.

$$\begin{array}{r} 53 \\ \times 6 \\ \hline \end{array} = \begin{array}{r} 50 \\ \times 6 \\ \hline \end{array} + \begin{array}{r} 3 \\ \times 6 \\ \hline \end{array}$$

The answer is \_\_\_\_.

2. Have the students play a game called *Multiadd*. Each player throws 3 dice and uses them to make an expression similar to those in the lesson.

## Enrichment

Assign *Multiplication Whiz* at the bottom of page 169.

## Extra Practice

Compute.

1.  $6 \times (4 + 4) =$  48
2.  $8 \times (5 + 3) =$  64
3.  $9 \times (6 + 3) =$  81
4.  $7 \times (2 + 7) =$  63
5.  $8 \times (4 + 5) =$  72
6.  $5 \times (5 + 6) =$  55
7.  $8 \times (7 + 5) =$  96
8.  $9 \times (10 + 5) =$  135
9.  $7 \times (20 + 30) =$  350
10.  $6 \times (40 + 50) =$  540
11.  $4 \times (40 + 20) =$  240
12.  $60 \times (7 + 2) =$  540

Solve.

13. In a parking lot there are 5 rows of 20 cars on the east side and 3 rows of 20 cars on the west side. How many cars are there altogether? 160

## Worksheet A39

Pages 168 - 169

# UNIT 8 LESSON 3

## Objective A40

Multiply a two-digit number by a one-digit number, with no regrouping.

## Introducing the Lesson

Do several problems of the following form with the students.

$$\begin{array}{r} 62 \\ \times 3 \\ \hline \end{array} = \begin{array}{r} 60 \\ \times 3 \\ \hline \end{array} + \begin{array}{r} 2 \\ \times 3 \\ \hline \end{array}$$

The answer is \_\_\_\_.

## Teaching the Lesson

Read the lesson example on page 170 and study the first solution together. Write it again on the chalkboard so you can be sure the students are all noting the same parts as you discuss it. Point out that the solution is worked out with the same thinking as in the problems done in Introducing the Lesson.

Do many other examples in the long form together. Restrict the examples to those with no regrouping of ones. You may not want to go on to the short form for some time. Give the students ample time and practice until they are sure of what they are doing. However, the students must learn the short form in order to multiply by two- and three-digit numbers later.

## Two-Place Multiplication

Dodd's Market sells 2 cases of peanuts every week.

There are 24 cans of peanuts in each case.

How many cans of peanuts do they sell each week?

They sell  $24 \text{ cans} + 24 \text{ cans} = 48 \text{ cans}$ .

You could multiply.

Multiply

$2 \times 4 \text{ ones}$ .

Multiply

$2 \times 2 \text{ tens}$ .

Add

$$\begin{array}{r} 24 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 24 \\ \times 2 \\ \hline 8 \end{array}$$

$$\begin{array}{r} 24 \\ \times 2 \\ \hline 8 \\ 40 \end{array}$$

$$\begin{array}{r} 24 \\ \times 2 \\ \hline 8 \\ 40 \\ \hline 48 \end{array}$$

$$\begin{array}{r} 24 \\ \times 2 \\ \hline 8 \\ 40 \\ \hline 48 \end{array}$$

This way is shorter.

$$\begin{array}{r} 24 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 24 \\ \times 2 \\ \hline 8 \end{array}$$

$$\begin{array}{r} 24 \\ \times 2 \\ \hline 48 \end{array}$$

$$\begin{array}{r} 24 \\ \times 2 \\ \hline 48 \end{array}$$

They sell 48 cans of peanuts each week.

## EXERCISES

Multiply.

$$\begin{array}{r} 1. \quad 30 \\ \times 2 \\ \hline 60 \end{array}$$

$$\begin{array}{r} 2. \quad 2 \\ \times 2 \\ \hline 4 \end{array}$$

$$\begin{array}{r} 3. \quad 32 \\ \times 2 \\ \hline 64 \end{array}$$

$$\begin{array}{r} 4. \quad 42 \\ \times 2 \\ \hline 84 \end{array}$$

$$\begin{array}{r} 5. \quad 32 \\ \times 3 \\ \hline 96 \end{array}$$

$$\begin{array}{r} 6. \quad 40 \\ \times 3 \\ \hline 120 \end{array}$$

$$\begin{array}{r} 7. \quad 2 \\ \times 3 \\ \hline 6 \end{array}$$

$$\begin{array}{r} 8. \quad 42 \\ \times 3 \\ \hline 126 \end{array}$$

$$\begin{array}{r} 9. \quad 52 \\ \times 3 \\ \hline 156 \end{array}$$

$$\begin{array}{r} 10. \quad 42 \\ \times 4 \\ \hline 168 \end{array}$$

$$\begin{array}{r} 11. \quad 50 \\ \times 6 \\ \hline 300 \end{array}$$

$$\begin{array}{r} 12. \quad 1 \\ \times 6 \\ \hline 6 \end{array}$$

$$\begin{array}{r} 13. \quad 51 \\ \times 6 \\ \hline 306 \end{array}$$

$$\begin{array}{r} 14. \quad 71 \\ \times 6 \\ \hline 426 \end{array}$$

$$\begin{array}{r} 15. \quad 71 \\ \times 8 \\ \hline 568 \end{array}$$

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## Using the Exercises

- Point out that the first two questions in the row are parts of the third question. Ask a student to point out where the partial solutions are found in the solution to the third question (written in the long form).
- Ask students to explain the parts of their solutions for the fourth and fifth questions in each row.
- Before you are finished with this lesson, do some of the questions on the chalkboard in both the long form and the short form. Do not insist the students adopt the short form yet, but do expose them to it.



## PRACTICE

Multiply.

- |   |   |   |   |   |
|---|---|---|---|---|
| 1. $\begin{array}{r} 11 \\ \times 3 \\ \hline 33 \end{array}$   | 2. $\begin{array}{r} 12 \\ \times 4 \\ \hline 48 \end{array}$   | 3. $\begin{array}{r} 13 \\ \times 3 \\ \hline 39 \end{array}$   | 4. $\begin{array}{r} 14 \\ \times 2 \\ \hline 28 \end{array}$   | 5. $\begin{array}{r} 41 \\ \times 2 \\ \hline 82 \end{array}$   |
| 6. $\begin{array}{r} 31 \\ \times 3 \\ \hline 93 \end{array}$   | 7. $\begin{array}{r} 23 \\ \times 2 \\ \hline 46 \end{array}$   | 8. $\begin{array}{r} 21 \\ \times 4 \\ \hline 84 \end{array}$   | 9. $\begin{array}{r} 32 \\ \times 3 \\ \hline 96 \end{array}$   | 10. $\begin{array}{r} 42 \\ \times 2 \\ \hline 84 \end{array}$  |
| 11. $\begin{array}{r} 32 \\ \times 4 \\ \hline 128 \end{array}$ | 12. $\begin{array}{r} 43 \\ \times 3 \\ \hline 129 \end{array}$ | 13. $\begin{array}{r} 53 \\ \times 2 \\ \hline 106 \end{array}$ | 14. $\begin{array}{r} 62 \\ \times 4 \\ \hline 248 \end{array}$ | 15. $\begin{array}{r} 71 \\ \times 5 \\ \hline 355 \end{array}$ |
| 16. $\begin{array}{r} 64 \\ \times 2 \\ \hline 128 \end{array}$ | 17. $\begin{array}{r} 73 \\ \times 3 \\ \hline 219 \end{array}$ | 18. $\begin{array}{r} 82 \\ \times 4 \\ \hline 328 \end{array}$ | 19. $\begin{array}{r} 61 \\ \times 6 \\ \hline 366 \end{array}$ | 20. $\begin{array}{r} 94 \\ \times 2 \\ \hline 188 \end{array}$ |

Solve.

- Frances bought 3 tins of cat food. Each tin cost 32¢. How much did she pay? **96 ¢**
- Mr. Shreyer's classroom has 31 desks. He put 2 pens and 3 books on each desk. How many books did he put out? **93 books**
- Chris bought 4 dozen doughnuts. How many doughnuts was that? **48**

## USING THE CALCULATOR

Use a calculator to find the products.

- |  |  |
|--|--|
| <b>54</b> $6 \times 9$                 | $9 \times 6$ <b>54</b>                 |
| <b>235</b> $47 \times 5$               | $5 \times 47$ <b>235</b>               |
| <b>288</b> $8 \times 36$               | $36 \times 8$ <b>288</b>               |
| <b>1007</b> $53 \times 19$             | $19 \times 53$ <b>1007</b>             |
| <b>1836</b> $27 \times 68$             | $68 \times 27$ <b>1836</b>             |
| <b>21 350</b> $14 \times 25 \times 61$ | $25 \times 61 \times 14$ <b>21 350</b> |



Does changing the **order** of multiplication change the product?

**No.** 171

## Assigning the Practice

Minimum: 1-15, 21

Average: 6-22

Enriched: 11-23

## Reinforcement

Ask the students to illustrate problems 6 to 10 of the Practice using place-value blocks.

## Enrichment

- Assign *Using the Calculator* at the bottom of page 171.
- Ask students to use the short form for problems 16 to 20 of the Practice.

## Extra Practice

Multiply.

- |   |   |   |   |   |
|---|---|---|---|---|
| 1. $\begin{array}{r} 12 \\ \times 4 \\ \hline 48 \end{array}$   | 2. $\begin{array}{r} 31 \\ \times 3 \\ \hline 93 \end{array}$   | 3. $\begin{array}{r} 43 \\ \times 2 \\ \hline 86 \end{array}$   | 4. $\begin{array}{r} 93 \\ \times 2 \\ \hline 186 \end{array}$  | 5. $\begin{array}{r} 23 \\ \times 3 \\ \hline 69 \end{array}$   |
| 6. $\begin{array}{r} 42 \\ \times 3 \\ \hline 126 \end{array}$  | 7. $\begin{array}{r} 51 \\ \times 5 \\ \hline 255 \end{array}$  | 8. $\begin{array}{r} 72 \\ \times 2 \\ \hline 144 \end{array}$  | 9. $\begin{array}{r} 82 \\ \times 4 \\ \hline 328 \end{array}$  | 10. $\begin{array}{r} 31 \\ \times 6 \\ \hline 186 \end{array}$ |
| 11. $\begin{array}{r} 64 \\ \times 2 \\ \hline 128 \end{array}$ | 12. $\begin{array}{r} 83 \\ \times 3 \\ \hline 249 \end{array}$ | 13. $\begin{array}{r} 91 \\ \times 8 \\ \hline 728 \end{array}$ | 14. $\begin{array}{r} 71 \\ \times 3 \\ \hline 213 \end{array}$ | 15. $\begin{array}{r} 52 \\ \times 4 \\ \hline 208 \end{array}$ |

Solve.

- The science class watched 3 films. Each was 13 minutes long. How long did the class watch the films? **39 min**

## Worksheet A40

Pages 170-171

# UNIT 8 LESSON 4

## Objective A41

Multiply a two-digit number by a one-digit number, with regrouping of ones.

## Introducing the Lesson

Do a quick oral review of the basic multiplication facts to  $9 \times 9$ , using either flash cards or a game the students enjoy.

## Teaching the Lesson

Read the lesson example on page 172. As you discuss the solution, illustrate it for the students with place-value blocks.



12 tens and 24 ones  
 $= 120 + 24$   
 $= 144$

Show how the blocks and rods correspond to the long form of the solution. Then put all the ones blocks together, making 24. Regroup 20 of them as 2 tens.



14 tens and 4 ones  
 $= 144$

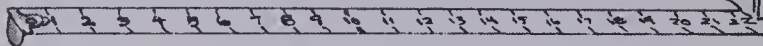
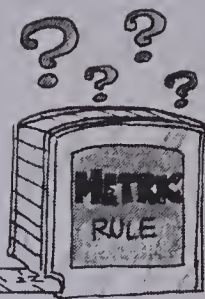
Write the short form of the solution on the chalkboard and discuss it. Point out how the regrouping of 20 ones as 2 tens is shown.

$$\begin{array}{r} 2 \\ 36 \\ \times 4 \\ \hline 144 \end{array}$$

Do several examples together in both the long form and the short form.

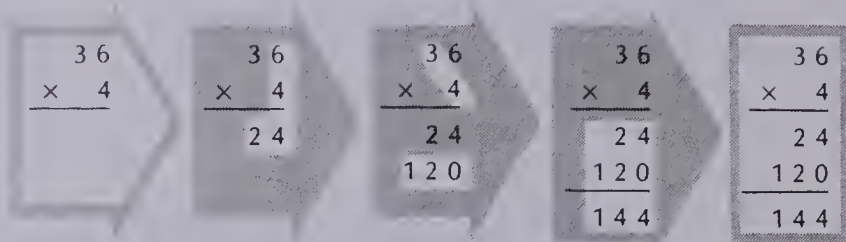
# Two-Place Multiplication

In Dodd's Market, there are 36 sets of shelves. Each set is 4 m long. What's the total length of shelves?



Remember that 36 is  $30 + 6$ .

Write the question.      Multiply  $4 \times 6$  ones.      Multiply  $4 \times 3$  tens.      Add.



There are 144 m of shelf space.

## EXERCISES

Multiply.

1. $\begin{array}{r} 20 \\ \times 2 \\ \hline 40 \end{array}$	2. $\begin{array}{r} 5 \\ \times 2 \\ \hline 10 \end{array}$	3. $\begin{array}{r} 25 \\ \times 2 \\ \hline 50 \end{array}$	4. $\begin{array}{r} 45 \\ \times 2 \\ \hline 90 \end{array}$	5. $\begin{array}{r} 25 \\ \times 3 \\ \hline 75 \end{array}$
6. $\begin{array}{r} 50 \\ \times 3 \\ \hline 150 \end{array}$	7. $\begin{array}{r} 4 \\ \times 3 \\ \hline 12 \end{array}$	8. $\begin{array}{r} 54 \\ \times 3 \\ \hline 162 \end{array}$	9. $\begin{array}{r} 74 \\ \times 3 \\ \hline 222 \end{array}$	10. $\begin{array}{r} 54 \\ \times 4 \\ \hline 216 \end{array}$
11. $\begin{array}{r} 60 \\ \times 4 \\ \hline 240 \end{array}$	12. $\begin{array}{r} 7 \\ \times 4 \\ \hline 28 \end{array}$	13. $\begin{array}{r} 67 \\ \times 4 \\ \hline 268 \end{array}$	14. $\begin{array}{r} 77 \\ \times 4 \\ \hline 308 \end{array}$	15. $\begin{array}{r} 67 \\ \times 5 \\ \hline 335 \end{array}$

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## Using the Exercises

- Point out how the first two questions in a row are parts of the third question. After students have shown their work for the third question, ask them to do it in the short form. Discuss the procedure.
- Ask the students to do the last two questions in each row in both the long form and the short form.

## PRACTICE

Multiply.

1.  $\begin{array}{r} 35 \\ \times 2 \\ \hline 70 \end{array}$
2.  $\begin{array}{r} 24 \\ \times 3 \\ \hline 72 \end{array}$
3.  $\begin{array}{r} 14 \\ \times 4 \\ \hline 56 \end{array}$
4.  $\begin{array}{r} 25 \\ \times 3 \\ \hline 75 \end{array}$
5.  $\begin{array}{r} 17 \\ \times 4 \\ \hline 68 \end{array}$
6.  $\begin{array}{r} 43 \\ \times 4 \\ \hline 172 \end{array}$
7.  $\begin{array}{r} 26 \\ \times 5 \\ \hline 130 \end{array}$
8.  $\begin{array}{r} 18 \\ \times 6 \\ \hline 108 \end{array}$
9.  $\begin{array}{r} 35 \\ \times 5 \\ \hline 175 \end{array}$
10.  $\begin{array}{r} 37 \\ \times 4 \\ \hline 148 \end{array}$
11.  $\begin{array}{r} 56 \\ \times 4 \\ \hline 224 \end{array}$
12.  $\begin{array}{r} 68 \\ \times 5 \\ \hline 340 \end{array}$
13.  $\begin{array}{r} 49 \\ \times 6 \\ \hline 294 \end{array}$
14.  $\begin{array}{r} 75 \\ \times 7 \\ \hline 525 \end{array}$
15.  $\begin{array}{r} 66 \\ \times 7 \\ \hline 462 \end{array}$
16.  $\begin{array}{r} 68 \\ \times 7 \\ \hline 476 \end{array}$
17.  $\begin{array}{r} 76 \\ \times 9 \\ \hline 684 \end{array}$
18.  $\begin{array}{r} 87 \\ \times 6 \\ \hline 522 \end{array}$
19.  $\begin{array}{r} 96 \\ \times 8 \\ \hline 768 \end{array}$
20.  $\begin{array}{r} 79 \\ \times 9 \\ \hline 711 \end{array}$

Solve.

21. Canned soup is on sale at the store. You can get 3 tins for \$1. How many tins can you get for \$15? **45**

## REVIEW

Multiply.

- A38 1.  $\begin{array}{r} 30 \\ \times 3 \\ \hline 90 \end{array}$
2.  $\begin{array}{r} 40 \\ \times 2 \\ \hline 80 \end{array}$
3.  $\begin{array}{r} 80 \\ \times 5 \\ \hline 400 \end{array}$
4.  $\begin{array}{r} 60 \\ \times 8 \\ \hline 480 \end{array}$
5.  $\begin{array}{r} 70 \\ \times 9 \\ \hline 630 \end{array}$
- A39 6.  $6 \times (5 + 3)$  **48**
7.  $7 \times (7 + 2)$  **63**
8.  $8 \times (2 + 4)$  **48**
9.  $7 \times (30 + 40)$  **490**
- A40 10.  $\begin{array}{r} 44 \\ \times 2 \\ \hline 88 \end{array}$
11.  $\begin{array}{r} 32 \\ \times 3 \\ \hline 96 \end{array}$
12.  $\begin{array}{r} 61 \\ \times 8 \\ \hline 488 \end{array}$
13.  $\begin{array}{r} 73 \\ \times 3 \\ \hline 219 \end{array}$
14.  $\begin{array}{r} 94 \\ \times 2 \\ \hline 188 \end{array}$
- A41 15.  $\begin{array}{r} 37 \\ \times 2 \\ \hline 74 \end{array}$
16.  $\begin{array}{r} 19 \\ \times 6 \\ \hline 114 \end{array}$
17.  $\begin{array}{r} 58 \\ \times 5 \\ \hline 290 \end{array}$
18.  $\begin{array}{r} 77 \\ \times 7 \\ \hline 539 \end{array}$
19.  $\begin{array}{r} 86 \\ \times 9 \\ \hline 774 \end{array}$

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## Assigning the Practice

Minimum: 1-15

Average: 6-21

Enriched: 11-21

## Review Exercises

Questions	Objective	Pages
1-5	A38	166-167
6-9	A39	168-169
10-14	A40	170-171
15-19	A41	172-173

## Reinforcement

Two teams with 3 players each can play a multiplication game. Each member of one team writes a digit on a card and holds it up. The digits on the first and second cards are the tens and the ones digit of a number. The digit on the third card is its multiplier. The members of the other team find the product. If they all get the correct answer, the team scores a point. After 5 rounds, the team with the higher score wins.

## Enrichment

Ask the students to find the missing numbers.

$$\begin{array}{r} 2 \blacksquare \\ \times 5 \\ \hline 125 \end{array} \quad \begin{array}{r} \blacksquare 9 \\ \times 3 \\ \hline 57 \end{array} \quad \begin{array}{r} 8 \blacksquare \\ \times 7 \\ \hline \blacksquare 02 \end{array} \quad \begin{array}{r} \blacksquare \blacksquare \\ \times 4 \\ \hline 272 \end{array} \quad \begin{array}{r} 49 \\ \times \blacksquare \\ \hline 3 \blacksquare 2 \end{array}$$

## Extra Practice

Multiply.

1.  $\begin{array}{r} 24 \\ \times 3 \\ \hline 72 \end{array}$
2.  $\begin{array}{r} 18 \\ \times 4 \\ \hline 72 \end{array}$
3.  $\begin{array}{r} 36 \\ \times 2 \\ \hline 72 \end{array}$
4.  $\begin{array}{r} 75 \\ \times 3 \\ \hline 225 \end{array}$
5.  $\begin{array}{r} 35 \\ \times 5 \\ \hline 175 \end{array}$
6.  $\begin{array}{r} 45 \\ \times 5 \\ \hline 225 \end{array}$
7.  $\begin{array}{r} 56 \\ \times 4 \\ \hline 224 \end{array}$
8.  $\begin{array}{r} 38 \\ \times 6 \\ \hline 228 \end{array}$
9.  $\begin{array}{r} 86 \\ \times 5 \\ \hline 430 \end{array}$
10.  $\begin{array}{r} 23 \\ \times 7 \\ \hline 161 \end{array}$
11.  $\begin{array}{r} 79 \\ \times 8 \\ \hline 632 \end{array}$
12.  $\begin{array}{r} 67 \\ \times 8 \\ \hline 536 \end{array}$
13.  $\begin{array}{r} 78 \\ \times 6 \\ \hline 468 \end{array}$
14.  $\begin{array}{r} 56 \\ \times 9 \\ \hline 504 \end{array}$
15.  $\begin{array}{r} 35 \\ \times 7 \\ \hline 245 \end{array}$

Solve.

16. Six loaves of bread were bought for a picnic. Each loaf had 25 slices. How many slices of bread were there altogether? **150**

## Worksheet A41

Pages 172-173



# UNIT 8 LESSON 5

## Objective A42

Multiply a multiple of 100 by a one-digit number; estimate products using multiples of 10 or 100.

## Introducing the Lesson

Discuss situations in which it is not necessary to know exact numbers and how it is easier to think in terms of rounded numbers. Review the guides for rounding: when the next digit is less than 5, round *down*; when the next digit is 5 or more, round *up*.

## Teaching the Lesson

Discuss the lesson example on page 174. Draw a place-value chart on the chalkboard and write the example in it.

h	t	o	
8	0	0	
×		6	
48	0	0	

$$\begin{array}{r} 800 \\ \times 6 \\ \hline 4800 \end{array}$$

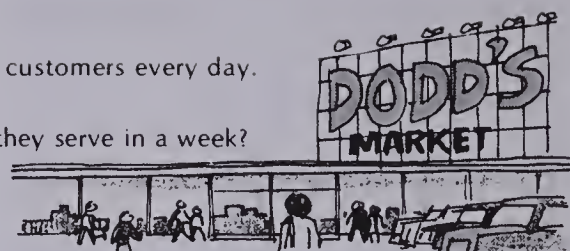
Discuss the solution and then erase the top and the vertical lines of the chart. Do several other similar examples on a chart, discuss each step, and then erase as before.

You can check by using repeated addition:

$$800 + 800 + 800 + 800 + 800 + 800 = 4800$$

## Multiples of 100

Dodd's Market serves about 800 customers every day. They are open 6 days a week. About how many customers do they serve in a week?



Write the question.

Multiply  $6 \times 0$  ones.

Multiply  $6 \times 0$  tens.

Multiply  $6 \times 8$  hundreds.

$$\begin{array}{r} 800 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 800 \\ \times 6 \\ \hline 0 \end{array}$$

$$\begin{array}{r} 800 \\ \times 6 \\ \hline 00 \end{array}$$

$$\begin{array}{r} 800 \\ \times 6 \\ \hline 4800 \end{array}$$

$$\begin{array}{r} 800 \\ \times 6 \\ \hline 4800 \end{array}$$

They serve about 4800 customers in a week.

## EXERCISES

Multiply.

- |  |  |  |  |   |
|--|--|--|--|---|
| 1. $\begin{array}{r} 4 \\ \times 2 \\ \hline 8 \end{array}$  | 2. $\begin{array}{r} 40 \\ \times 2 \\ \hline 80 \end{array}$  | 3. $\begin{array}{r} 400 \\ \times 2 \\ \hline 800 \end{array}$  | 4. $\begin{array}{r} 300 \\ \times 2 \\ \hline 600 \end{array}$  | 5. $\begin{array}{r} 300 \\ \times 3 \\ \hline 900 \end{array}$   |
| 6. $\begin{array}{r} 6 \\ \times 7 \\ \hline 42 \end{array}$ | 7. $\begin{array}{r} 60 \\ \times 7 \\ \hline 420 \end{array}$ | 8. $\begin{array}{r} 600 \\ \times 7 \\ \hline 4200 \end{array}$ | 9. $\begin{array}{r} 800 \\ \times 7 \\ \hline 5600 \end{array}$ | 10. $\begin{array}{r} 800 \\ \times 8 \\ \hline 6400 \end{array}$ |

Round to the nearest ten.

- |   |   |   |   |  |
|---|---|---|---|--|
| 11. $\begin{array}{r} 38 \\ 40 \end{array}$ | 12. $\begin{array}{r} 52 \\ 50 \end{array}$ | 13. $\begin{array}{r} 77 \\ 80 \end{array}$ | 14. $\begin{array}{r} 83 \\ 80 \end{array}$ | 15. $\begin{array}{r} 95 \\ 100 \end{array}$ |
|---|---|---|---|--|

Round to the nearest hundred.

- |   |   |   |   |   |
|---|---|---|---|---|
| 16. $\begin{array}{r} 235 \\ 200 \end{array}$ | 17. $\begin{array}{r} 468 \\ 500 \end{array}$ | 18. $\begin{array}{r} 739 \\ 700 \end{array}$ | 19. $\begin{array}{r} 647 \\ 600 \end{array}$ | 20. $\begin{array}{r} 550 \\ 600 \end{array}$ |
|---|---|---|---|---|

## Using the Exercises

- Compare the results of the first three questions in the first two rows to strengthen the appreciation of place value.
- Ask the students to compute mentally the answers for questions 4, 5, 9, and 10. Check their answers by computation.
- Review rounding as directed in the last two rows. If these skills are weak, supply extra practice.

## PRACTICE

Multiply.

1.  $\begin{array}{r} 400 \\ \times 2 \\ \hline 800 \end{array}$
2.  $\begin{array}{r} 200 \\ \times 4 \\ \hline 800 \end{array}$
3.  $\begin{array}{r} 300 \\ \times 3 \\ \hline 900 \end{array}$
4.  $\begin{array}{r} 100 \\ \times 5 \\ \hline 500 \end{array}$
5.  $\begin{array}{r} 200 \\ \times 3 \\ \hline 600 \end{array}$
6.  $\begin{array}{r} 400 \\ \times 5 \\ \hline 2000 \end{array}$
7.  $\begin{array}{r} 500 \\ \times 3 \\ \hline 1500 \end{array}$
8.  $\begin{array}{r} 300 \\ \times 4 \\ \hline 1200 \end{array}$
9.  $\begin{array}{r} 200 \\ \times 6 \\ \hline 1200 \end{array}$
10.  $\begin{array}{r} 600 \\ \times 4 \\ \hline 2400 \end{array}$
11.  $\begin{array}{r} 600 \\ \times 8 \\ \hline 4800 \end{array}$
12.  $\begin{array}{r} 700 \\ \times 9 \\ \hline 6300 \end{array}$
13.  $\begin{array}{r} 800 \\ \times 7 \\ \hline 5600 \end{array}$
14.  $\begin{array}{r} 500 \\ \times 9 \\ \hline 4500 \end{array}$
15.  $\begin{array}{r} 900 \\ \times 6 \\ \hline 5400 \end{array}$

Round the first number. Estimate the answer.

16.  $\begin{array}{r} 32 \\ \times 7 \\ \hline 210 \end{array}$
17.  $\begin{array}{r} 18 \\ \times 8 \\ \hline 160 \end{array}$
18.  $\begin{array}{r} 57 \\ \times 9 \\ \hline 540 \end{array}$
19.  $\begin{array}{r} 83 \\ \times 8 \\ \hline 640 \end{array}$
20.  $\begin{array}{r} 55 \\ \times 7 \\ \hline 420 \end{array}$
21.  $\begin{array}{r} 138 \\ \times 8 \\ \hline 800 \end{array}$
22.  $\begin{array}{r} 458 \\ \times 7 \\ \hline 3500 \end{array}$
23.  $\begin{array}{r} 779 \\ \times 8 \\ \hline 6400 \end{array}$
24.  $\begin{array}{r} 542 \\ \times 8 \\ \hline 4000 \end{array}$
25.  $\begin{array}{r} 250 \\ \times 7 \\ \hline 2100 \end{array}$

Solve.

26. The Jackes family spends about \$400 a month for food. About how much do they spend for food in 6 months? **\$2400**
27. Sam ran 5 times around a 400 m track. How far did he run altogether? **2000 m**
28. Dodd's Market sold 93 mops at \$6 each. How much were the total sales? Make an estimate, **\$600** then compute the answer. **\$558**

## Quick Stop?

If a car is travelling 100 kilometres per hour, it goes about 28 m in a second. How far will it go in 5 seconds? **140 m**

175

## Assigning the Practice

Minimum: 1-10, 16-25

Average: 6-27

Enriched: 11-28

## Reinforcement

1. Two people can play a rounding game. Number one die from 0 to 5, another from 2 to 7, and a third from 4 to 9. One player rolls the dice and uses the digits to make a number. The other player rounds the number to the hundreds place. The players reverse rolls.

2. Make a stencil of the following and either have the entire class work at it or use it for individual reinforcement for selected students.

### Math Bingo

Do all the answers below. When you are finished look for the answers on the bingo card and shade them in.

\*Note: Not all the answers will be found on the card.

1.  $18 \times 10 =$
2.  $500 \times 6 =$
3.  $400 \times 8 =$
4.  $700 \times 5 =$
5.  $900 \times 9 =$
6.  $6700 \times 1 =$
7.  $800 \times 3 =$
8.  $600 \times 9 =$
9.  $1300 \times 2 =$
10.  $100 \times 8 =$
11.  $100 \times 11 =$
12.  $7 \times 800 =$
13.  $70 \times 8 =$
14.  $900 \times 3 =$
15.  $3 \times 700 =$
16.  $10 \times 10 =$
17.  $1000 \times 7 =$
18.  $2 \times 600 =$
19.  $40 \times 3 =$
20.  $800 \times 2 =$
21.  $700 \times 1 =$
22.  $700 \times 7 =$
23.  $3000 \times 3 =$
24.  $600 \times 6 =$
25.  $7 \times 600 =$

B	I	N	G	O
3000	120	6700	160	800
100	300	1600	1800	2700
2100	1000	180	21000	2600
560	6900	2400	110	5400
1100	3200	4200	8100	3200

What did you find?

Answer:

Columns B, N, and O are shaded.

## Enrichment

Assign *Quick Stop* at the bottom of page 175.

## Extra Practice

Multiply.

1.  $\begin{array}{r} 200 \\ \times 4 \\ \hline 800 \end{array}$
2.  $\begin{array}{r} 300 \\ \times 3 \\ \hline 900 \end{array}$
3.  $\begin{array}{r} 400 \\ \times 2 \\ \hline 800 \end{array}$
4.  $\begin{array}{r} 700 \\ \times 7 \\ \hline 4900 \end{array}$
5.  $\begin{array}{r} 300 \\ \times 6 \\ \hline 1800 \end{array}$
6.  $\begin{array}{r} 600 \\ \times 8 \\ \hline 4800 \end{array}$
7.  $\begin{array}{r} 800 \\ \times 9 \\ \hline 7200 \end{array}$
8.  $\begin{array}{r} 900 \\ \times 6 \\ \hline 5400 \end{array}$
9.  $\begin{array}{r} 500 \\ \times 8 \\ \hline 4000 \end{array}$
10.  $\begin{array}{r} 500 \\ \times 5 \\ \hline 2500 \end{array}$

Round the first number. Estimate the answer.

11.  $\begin{array}{r} 49 \\ \times 6 \\ \hline 300 \end{array}$
12.  $\begin{array}{r} 821 \\ \times 4 \\ \hline 3200 \end{array}$
13.  $\begin{array}{r} 319 \\ \times 7 \\ \hline 2100 \end{array}$
14.  $\begin{array}{r} 93 \\ \times 9 \\ \hline 810 \end{array}$
15.  $\begin{array}{r} 214 \\ \times 7 \\ \hline 1400 \end{array}$
16.  $\begin{array}{r} 573 \\ \times 6 \\ \hline 3600 \end{array}$
17.  $\begin{array}{r} 75 \\ \times 8 \\ \hline 640 \end{array}$
18.  $\begin{array}{r} 947 \\ \times 5 \\ \hline 4500 \end{array}$
19.  $\begin{array}{r} 97 \\ \times 3 \\ \hline 300 \end{array}$
20.  $\begin{array}{r} 886 \\ \times 2 \\ \hline 1800 \end{array}$

## Worksheet A42

Pages 174 - 175

Objective A43

Multiply a three-digit number by a one-digit number, with regrouping of ones.

Introducing the Lesson

Have the students recall the process for multiplying a two-digit number by a one-digit number with regrouping of ones. Use the short form and illustrate the example with place-value blocks. Check using repeated addition.

Multiply ones and regroup.      Multiply tens and add the regrouped ten.

$$\begin{array}{r} 1 \\ 25 \\ \times 3 \\ \hline 5 \end{array}$$

7 tens

5 ones

$$\begin{array}{r} 1 \\ 25 \\ \times 3 \\ \hline 75 \end{array}$$

Teaching the Lesson

Tell the students that they are now going to multiply longer numbers, but that the method will be the same. Discuss the lesson example on page 176. Ask someone to write the short form of the solution on the chalkboard. Illustrate it with place-value blocks.

$$\begin{array}{r} 1 \\ 235 \\ \times 2 \\ \hline 470 \end{array}$$

4 hundreds, 6 tens, 10 ones

↓

4 hundreds, 7 tens

Make sure the steps for the short form of the solution are clear.

- 1. Multiply the ones and regroup them.
- 2. Multiply the tens; include (add) any regrouped ones.
- 3. Multiply the hundreds.

(In this lesson there will be no regrouping of tens.) Do several examples together.

Three-Place Multiplication

Friday and Saturday are busy days at the snack bar in Dodd's Market. They sell about 235 hot dogs each day. How many hot dogs do they sell altogether?



Write the question.

235  
× 2

Multiply

2 × 5 ones.

235  
× 2  
10

Multiply

2 × 3 tens.

235  
× 2  
10  
60

Multiply

2 × 2 hundreds.

235  
× 2  
10  
60  
400

Add.

235  
× 2  
10  
60  
400  
470

They sell 470 hot dogs in the 2 days.

EXERCISES

Multiply.

1. 6  
× 2  
12

2. 30  
× 2  
60

3. 400  
× 2  
800

4. 436  
× 2  
872

5. 4  
× 3  
12

6. 10  
× 3  
30

7. 300  
× 3  
900

8. 314  
× 3  
942

9. 6  
× 4  
24

10. 20  
× 4  
80

11. 400  
× 4  
1600

12. 426  
× 4  
1704

13. 345  
× 2  
690

14. 227  
× 3  
681

15. 516  
× 4  
2064

16. 728  
× 3  
2184

Using the Exercises

- In the first three rows, each problem is first broken up into three parts. Discuss why the result of the fourth question in the row should be the total of the results of the first three.
- The last row is mixed practice. Ask students to do these both the long way and the short way at the chalkboard.
- Encourage students to write their solutions on the board.
- Continue with the daily quizzes so that both students and teacher know what has been learned and where the weak spots are. Further teaching and drill exercises are required to overcome the problem areas. (This is sometimes referred to as diagnostic teaching.)



## PRACTICE

Multiply.

1.  $\begin{array}{r} 213 \\ \times 3 \\ \hline 639 \end{array}$
2.  $\begin{array}{r} 432 \\ \times 2 \\ \hline 864 \end{array}$
3.  $\begin{array}{r} 120 \\ \times 4 \\ \hline 480 \end{array}$
4.  $\begin{array}{r} 321 \\ \times 3 \\ \hline 963 \end{array}$
5.  $\begin{array}{r} 302 \\ \times 2 \\ \hline 604 \end{array}$
6.  $\begin{array}{r} 421 \\ \times 3 \\ \hline 1263 \end{array}$
7.  $\begin{array}{r} 532 \\ \times 2 \\ \hline 1064 \end{array}$
8.  $\begin{array}{r} 603 \\ \times 2 \\ \hline 1206 \end{array}$
9.  $\begin{array}{r} 312 \\ \times 4 \\ \hline 1248 \end{array}$
10.  $\begin{array}{r} 510 \\ \times 5 \\ \hline 2550 \end{array}$
11.  $\begin{array}{r} 325 \\ \times 3 \\ \hline 975 \end{array}$
12.  $\begin{array}{r} 216 \\ \times 4 \\ \hline 864 \end{array}$
13.  $\begin{array}{r} 304 \\ \times 3 \\ \hline 912 \end{array}$
14.  $\begin{array}{r} 416 \\ \times 2 \\ \hline 832 \end{array}$
15.  $\begin{array}{r} 127 \\ \times 3 \\ \hline 381 \end{array}$
16.  $\begin{array}{r} 628 \\ \times 3 \\ \hline 1884 \end{array}$
17.  $\begin{array}{r} 517 \\ \times 4 \\ \hline 2068 \end{array}$
18.  $\begin{array}{r} 706 \\ \times 6 \\ \hline 4236 \end{array}$
19.  $\begin{array}{r} 829 \\ \times 3 \\ \hline 2487 \end{array}$
20.  $\begin{array}{r} 928 \\ \times 2 \\ \hline 1856 \end{array}$

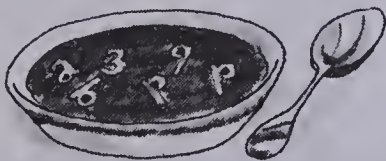
Solve.

21. A roll of tape is 329 cm long. How much tape is there in 3 rolls? **987 cm**
22. A soft drink bottling machine can fill 145 large bottles each minute. How many bottles are filled in 2 minutes? **290**
23. A round trip to the Carter's cottage is 216 km. How far do the Carter's travel if they make the trip 4 times? **864 km**

## Alphabet Soup

**a=4 b=2 c=1 p=5 q=2**

Here are 2 multiplication puzzles.  
Each letter stands for a digit.  
Find the missing digits.



$$\begin{array}{r} a\ b\ 3 \\ \times\ 4 \\ \hline 1\ 2 \\ 8\ 0 \\ c\ 6\ 0\ 0 \\ \hline c\ 6\ 9\ 2 \end{array}$$

$$\begin{array}{r} p\ q\ p \\ \times\ 3 \\ \hline 1\ p \\ 6\ 0 \\ 1\ p\ 0\ 0 \\ \hline 1\ p\ 7\ p \end{array}$$

177

## Assigning the Practice

Minimum: 1-15, 21

Average: 6-22

Enriched: 11-23

## Reinforcement

Ask students to do this cross-number puzzle.

1		2			3		4
5	6			7			
			8				

Across

1.  $417 \times 4$

5.  $139 \times 2$

7.  $748 \times 2$

8.  $95 \times 3$

Down

2.  $216 \times 3$

3.  $615 \times 3$

4.  $517 \times 4$

6.  $8 \times 9$

7.  $3 \times 6$

## Enrichment

Assign *Alphabet Soup* at the bottom of page 177.

## Extra Practice

Multiply.

1.  $\begin{array}{r} 216 \\ \times 3 \\ \hline 648 \end{array}$
2.  $\begin{array}{r} 308 \\ \times 4 \\ \hline 1232 \end{array}$
3.  $\begin{array}{r} 139 \\ \times 2 \\ \hline 278 \end{array}$
4.  $\begin{array}{r} 425 \\ \times 3 \\ \hline 1275 \end{array}$
5.  $\begin{array}{r} 613 \\ \times 4 \\ \hline 2452 \end{array}$
6.  $\begin{array}{r} 824 \\ \times 4 \\ \hline 3296 \end{array}$
7.  $\begin{array}{r} 615 \\ \times 3 \\ \hline 1845 \end{array}$
8.  $\begin{array}{r} 709 \\ \times 6 \\ \hline 4254 \end{array}$
9.  $\begin{array}{r} 538 \\ \times 2 \\ \hline 1076 \end{array}$
10.  $\begin{array}{r} 214 \\ \times 7 \\ \hline 1498 \end{array}$
11.  $\begin{array}{r} 936 \\ \times 2 \\ \hline 1872 \end{array}$
12.  $\begin{array}{r} 747 \\ \times 2 \\ \hline 1494 \end{array}$
13.  $\begin{array}{r} 629 \\ \times 3 \\ \hline 1887 \end{array}$
14.  $\begin{array}{r} 817 \\ \times 5 \\ \hline 4085 \end{array}$
15.  $\begin{array}{r} 513 \\ \times 8 \\ \hline 4104 \end{array}$

Solve.

16. Henry's Pea Soup comes in 227 mL tins. How many millilitres are there in 3 tins? **681 mL**

## Worksheet A43

Pages 176 - 177

# UNIT 8 LESSON 7

## Objective A44

Multiply a three-digit number by a one-digit number, with regrouping of ones and tens.

## Introducing the Lesson

Ask the students to suggest as many ways as they can think of to solve  $325 \times 3$ . Write these on the chalkboard. They may suggest:

1	<div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div style="display: inline-block; width: 10px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div style="display: inline-block; width: 10px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div style="display: inline-block; width: 10px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div style="display: inline-block; width: 10px; height: 20px; border: 1px solid black;"></div>
325	<div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div style="display: inline-block; width: 10px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div style="display: inline-block; width: 10px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div style="display: inline-block; width: 10px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div style="display: inline-block; width: 10px; height: 20px; border: 1px solid black;"></div>
325	<div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div style="display: inline-block; width: 10px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div style="display: inline-block; width: 10px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div style="display: inline-block; width: 10px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div style="display: inline-block; width: 10px; height: 20px; border: 1px solid black;"></div>
+325	<div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div style="display: inline-block; width: 20px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div style="display: inline-block; width: 10px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div style="display: inline-block; width: 10px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div style="display: inline-block; width: 10px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div style="display: inline-block; width: 10px; height: 20px; border: 1px solid black;"></div>
975	

9 hundreds, 6 tens, 15 ones  
= 9 hundreds, 7 tens, 5 ones

325	$3 \times 5 \text{ ones} = 15$	1
$\times 3$	$3 \times 2 \text{ tens} = 60$	325
15	$3 \times 3 \text{ hundreds} = 900$	$\times 3$
60	975	975
900		
975		

## Teaching the Lesson

Read the lesson example on page 178. Discuss the long form of the solution shown there. Then write the same problem on a place-value table.

Discuss the regrouping involved. Then erase the top and the vertical lines. Ask the students to help you write the directions for solving the problem using the short form.

Multiply ones.	Multiply tens.
Regroup.	Add the regrouped ten.
1	Regroup.
284	21
$\times 3$	284
2	$\times 3$
	52

Multiply hundreds.  
Add the regrouped hundreds.

21
284
$\times 3$
852

Do several other similar examples in both the long form and the short form.

## Three-Place Multiplication

Jason bought 3 cans of Meaty-O's for camping. Each can contains 284 g. How many grams of Meaty-O's did Jason get?

Write the question. Multiply  $3 \times 4$  ones. Multiply  $3 \times 8$  tens. Multiply  $3 \times 2$  hundreds. Add.

$\begin{array}{r} 284 \\ \times 3 \\ \hline \end{array}$	$\begin{array}{r} 284 \\ \times 3 \\ \hline 12 \end{array}$	$\begin{array}{r} 284 \\ \times 3 \\ \hline 12 \\ 240 \end{array}$	$\begin{array}{r} 284 \\ \times 3 \\ \hline 12 \\ 240 \\ 600 \end{array}$	$\begin{array}{r} 284 \\ \times 3 \\ \hline 12 \\ 240 \\ 600 \\ \hline 852 \end{array}$
--	---	--	---	---

Jason got 852 g of Meaty-O's.

## EXERCISES

Multiply.

- |   |   |   |   |
|---|---|---|---|
| 1. $\begin{array}{r} 6 \\ \times 3 \\ \hline 18 \end{array}$  | 2. $\begin{array}{r} 20 \\ \times 3 \\ \hline 60 \end{array}$   | 3. $\begin{array}{r} 500 \\ \times 3 \\ \hline 1500 \end{array}$  | 4. $\begin{array}{r} 526 \\ \times 3 \\ \hline 1578 \end{array}$  |
| 5. $\begin{array}{r} 5 \\ \times 2 \\ \hline 10 \end{array}$  | 6. $\begin{array}{r} 60 \\ \times 2 \\ \hline 120 \end{array}$  | 7. $\begin{array}{r} 400 \\ \times 2 \\ \hline 800 \end{array}$   | 8. $\begin{array}{r} 465 \\ \times 2 \\ \hline 930 \end{array}$   |
| 9. $\begin{array}{r} 7 \\ \times 5 \\ \hline 35 \end{array}$  | 10. $\begin{array}{r} 80 \\ \times 5 \\ \hline 400 \end{array}$ | 11. $\begin{array}{r} 100 \\ \times 5 \\ \hline 500 \end{array}$  | 12. $\begin{array}{r} 187 \\ \times 5 \\ \hline 935 \end{array}$  |
| 13. $\begin{array}{r} 3 \\ \times 6 \\ \hline 18 \end{array}$ | 14. $\begin{array}{r} 40 \\ \times 6 \\ \hline 240 \end{array}$ | 15. $\begin{array}{r} 600 \\ \times 6 \\ \hline 3600 \end{array}$ | 16. $\begin{array}{r} 643 \\ \times 6 \\ \hline 3858 \end{array}$ |

178

## Using the Exercises

- Each row separates a problem into three parts and then gives the entire problem. Ask students to compare the combined results of the first three with the fourth.
- Ask students to show the short form of the solution on the chalkboard. Have them explain the steps.

Multiply.

## PRACTICE

1.  $\begin{array}{r} 421 \\ \times 3 \\ \hline 1263 \end{array}$
2.  $\begin{array}{r} 332 \\ \times 2 \\ \hline 664 \end{array}$
3.  $\begin{array}{r} 501 \\ \times 4 \\ \hline 2004 \end{array}$
4.  $\begin{array}{r} 720 \\ \times 3 \\ \hline 2160 \end{array}$
5.  $\begin{array}{r} 403 \\ \times 2 \\ \hline 806 \end{array}$
6.  $\begin{array}{r} 445 \\ \times 2 \\ \hline 890 \end{array}$
7.  $\begin{array}{r} 328 \\ \times 3 \\ \hline 984 \end{array}$
8.  $\begin{array}{r} 617 \\ \times 4 \\ \hline 2468 \end{array}$
9.  $\begin{array}{r} 726 \\ \times 3 \\ \hline 2178 \end{array}$
10.  $\begin{array}{r} 919 \\ \times 5 \\ \hline 4595 \end{array}$
11.  $\begin{array}{r} 354 \\ \times 2 \\ \hline 708 \end{array}$
12.  $\begin{array}{r} 267 \\ \times 3 \\ \hline 801 \end{array}$
13.  $\begin{array}{r} 186 \\ \times 4 \\ \hline 744 \end{array}$
14.  $\begin{array}{r} 259 \\ \times 3 \\ \hline 777 \end{array}$
15.  $\begin{array}{r} 278 \\ \times 2 \\ \hline 556 \end{array}$
16.  $\begin{array}{r} 768 \\ \times 6 \\ \hline 4608 \end{array}$
17.  $\begin{array}{r} 498 \\ \times 7 \\ \hline 3486 \end{array}$
18.  $\begin{array}{r} 963 \\ \times 9 \\ \hline 8667 \end{array}$
19.  $\begin{array}{r} 754 \\ \times 8 \\ \hline 6032 \end{array}$
20.  $\begin{array}{r} 985 \\ \times 7 \\ \hline 6895 \end{array}$

Solve.

21. Dodd's Market sells about 245 copies of *Today* magazine every week. How many copies do they sell in 6 weeks? **1470 copies**
22. Agnes bought 6 bottles of shampoo on sale. Each bottle contains 350 mL. How many millilitres of shampoo did she buy in all? **2100 mL**
23. The corner milk store was open 363 days last year. Mr. Shu worked a 5 hour shift each of those days before going on holiday. How many hours did he work? **1815 h**

## Pay Roll

A baker had 6 people working for him.

Each person makes \$64 a day.

How much money will the baker have to pay for their salaries in a week (5 days)? **\$1920**

179

## Assigning the Practice

Minimum: 1-15, 21

Average: 6-22

Enriched: 11-23

## Reinforcement

Ask the students to complete the multiplication boxes.

Multiply across.

Multiply down.

× →		
15	2	
3	3	

× →		
47	4	
3	2	

× →		
68	3	
2	3	

## Enrichment

1. Assign *Pay Roll* at the bottom of page 179.

2. Have the students make a list of supermarket items measured in millilitres or grams. Ask them to make up multiplication problems about these items.

## Extra Practice

## Worksheet A44

Pages 178 - 179

Multiply.

1.  $\begin{array}{r} 327 \\ \times 6 \\ \hline 1962 \end{array}$
2.  $\begin{array}{r} 434 \\ \times 5 \\ \hline 2170 \end{array}$
3.  $\begin{array}{r} 572 \\ \times 6 \\ \hline 3432 \end{array}$
4.  $\begin{array}{r} 283 \\ \times 7 \\ \hline 1981 \end{array}$
5.  $\begin{array}{r} 219 \\ \times 6 \\ \hline 1314 \end{array}$
6.  $\begin{array}{r} 539 \\ \times 4 \\ \hline 2156 \end{array}$
7.  $\begin{array}{r} 644 \\ \times 8 \\ \hline 5152 \end{array}$
8.  $\begin{array}{r} 493 \\ \times 5 \\ \hline 2465 \end{array}$
9.  $\begin{array}{r} 537 \\ \times 6 \\ \hline 3222 \end{array}$
10.  $\begin{array}{r} 336 \\ \times 7 \\ \hline 2352 \end{array}$
11.  $\begin{array}{r} 728 \\ \times 6 \\ \hline 4368 \end{array}$
12.  $\begin{array}{r} 836 \\ \times 7 \\ \hline 5852 \end{array}$
13.  $\begin{array}{r} 437 \\ \times 8 \\ \hline 3496 \end{array}$
14.  $\begin{array}{r} 956 \\ \times 3 \\ \hline 2868 \end{array}$
15.  $\begin{array}{r} 912 \\ \times 9 \\ \hline 8208 \end{array}$

Solve.

16. One loaf of bread has a mass of 680 g. What is the mass of 6 loaves? **4080 g**



# UNIT 8 LESSON 8

## Objective A45

Multiply three factors (associative property).

## Introducing the Lesson

Review the order property of multiplication.

$$\begin{array}{r} 6 \\ \times 7 \\ \hline \end{array} \text{ gives the same result as } \begin{array}{r} 7 \\ \times 6 \\ \hline \end{array}$$

or  $29 \times 4 = 4 \times 29$

Discuss larger numbers and whether or not the order property still holds.

## Teaching the Lesson

Review the meaning of parentheses in a mathematical expression *Do the part in the parentheses first.*

Then read and discuss the lesson example on page 180. Make sure that the students understand where the 48 in the first solution and the 42 in the second solution come from.

The students can call the property discussed in this lesson the *grouping property* (do not yet name it the associative property). Write another example on the chalkboard.

$$12 \times 2 \times 6$$

Ask for two ways to solve it.

$$12 \times (2 \times 6) = 12 \times 12 = 144$$

$$(12 \times 2) \times 6 = 24 \times 6 = 144$$

Ask whether or not the property holds for larger numbers. Do several examples together. Discuss how the grouping property could make these problems easier to solve.

$$16 \times 2 \times 5$$

$$421 \times 25 \times 4$$

# Multiplying Three Factors

André was stacking butter at the supermarket. He made 8 rows with 6 packages each. Then he made 7 layers like that. How many packages of butter did he stack?

$$8 \times 6 \times 7 = \blacksquare$$

You can solve this two ways.

$$(8 \times 6) \times 7 = 48 \times 7$$

$$\begin{array}{r} 48 \\ \times 7 \\ \hline 336 \end{array}$$

or  $8 \times (6 \times 7) = 8 \times 42$

$$\begin{array}{r} 42 \\ \times 8 \\ \hline 336 \end{array}$$

André stacked 336 packages of butter.



## EXERCISES

Multiply.

1.  $2 \times 3$  6
2.  $6 \times 4$  24
3.  $3 \times 4$  12
4.  $2 \times 12$  24
5.  $2 \times 3 \times 4$  24
6.  $4 \times 5$  20
7.  $20 \times 3$  60
8.  $5 \times 3$  15
9.  $4 \times 15$  60
10.  $4 \times 5 \times 3$  60
11.  $7 \times 3$  21
12.  $21 \times 5$  105
13.  $3 \times 5$  15
14.  $7 \times 15$  105
15.  $7 \times 3 \times 5$  105
16.  $2 \times 6$  12
17.  $12 \times 8$  96
18.  $6 \times 8$  48
19.  $2 \times 48$  96
20.  $2 \times 6 \times 8$  96

180

## Using the Exercises

- Write on the chalkboard the last question in each row with the numbers grouped in two different ways.

$$(2 \times 3) \times 4 \quad 2 \times (3 \times 4)$$

The first four questions in the row are the parts to these solutions. Have the students show that both ways give the same result.

## PRACTICE

Multiply.

1.  $2 \times 1 \times 2 = 4$
2.  $2 \times 2 \times 2 = 8$
3.  $2 \times 1 \times 3 = 6$
4.  $3 \times 2 \times 3 = 18$
5.  $3 \times 2 \times 4 = 24$
6.  $4 \times 3 \times 4 = 48$
7.  $4 \times 2 \times 0 = 0$
8.  $4 \times 3 \times 1 = 12$
9.  $4 \times 4 \times 2 = 32$
10.  $5 \times 2 \times 3 = 30$
11.  $5 \times 4 \times 4 = 80$
12.  $4 \times 5 \times 6 = 120$
13.  $2 \times 3 \times 12 = 72$
14.  $5 \times 2 \times 20 = 200$
15.  $7 \times 8 \times 9 = 504$

Solve.

16. There are 4 packets of instant soup in a box, and 24 boxes in a carton. How many packets of soup are in 5 cartons?  $480$
17. A case of litre bottles of cola contains 4 rows of 3 bottles. How many bottles are there in 6 cases?  $72$

## Paper Folding

Marion bought a long length of paper.

How many times must she fold the paper in half to get more than 1000 sections?

10 times.  $2^{10} = 1024$



1 fold  
2 sections



2 folds  
4 sections



3 folds  
8 sections

181

## Assigning the Practice

Minimum: 1-16

Average: 1-17

Enriched: 1-17

## Reinforcement

Use part of a deck of cards to make 2 sets of cards numbered from 1 to 9 (aces are ones) and a 0 (the Joker). Have each student shuffle the cards, draw three cards to make a multiplication problem, and compute the answer.

## Enrichment

Assign *Paper Folding* at the bottom of page 181.

## Extra Practice

## Worksheet A45

Pages 180 - 181

Multiply.

1.  $3 \times 2 \times 2 = 12$
2.  $3 \times 5 \times 4 = 60$
3.  $4 \times 5 \times 6 = 120$
4.  $6 \times 7 \times 5 = 210$
5.  $7 \times 8 \times 0 = 0$
6.  $7 \times 4 \times 3 = 84$
7.  $9 \times 7 \times 4 = 252$
8.  $8 \times 6 \times 8 = 384$
9.  $3 \times 2 \times 9 = 54$
10.  $2 \times 5 \times 10 = 100$
11.  $6 \times 3 \times 9 = 162$
12.  $2 \times 4 \times 80 = 640$

Solve.

13. Eight pieces of cheese are individually wrapped in a package. Twelve packages are packed into a carton. How many pieces of cheese are in 4 cartons?  $384$

# UNIT 8 LESSON 9

## Objective PS8

Solve problems with multiplication or division.

## Introducing the Lesson

Ask how multiplication and division might be used at a supermarket. If you have visited a supermarket as a class, the students will have some realistic answers. Ask the students to bring in grocery store ads.

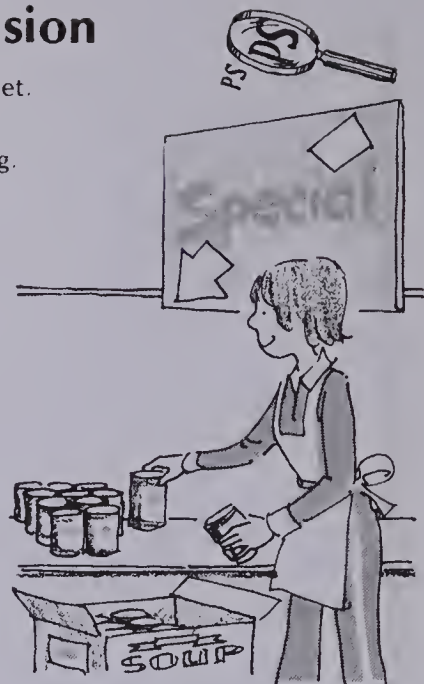
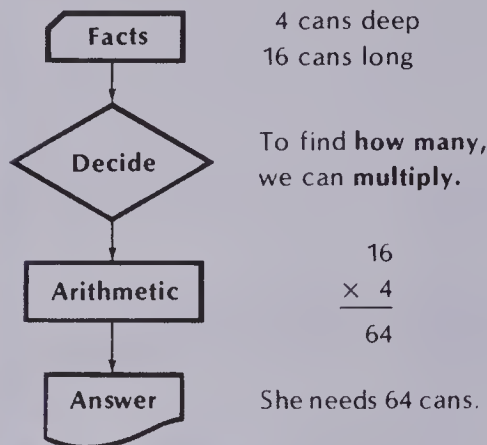
## Teaching the Lesson

Read the lesson example and discuss the solution on page 182.

Review the key words that suggest multiplication or division; write these on the chalkboard in two columns. Ask the students to suggest questions or problem situations which call for multiplication or division. Identify them.

## Multiplication and Division

Marnie is setting up a display at the supermarket. The first layer of the display is cans of soup. Marnie is making it 4 cans deep by 16 cans long. How many cans of soup does she need?



### EXERCISES

Would you be more likely to **multiply** or **divide**?

- |                                   |                 |                               |                 |
|-----------------------------------|-----------------|-------------------------------|-----------------|
| 1. How many are there altogether? | <b>Multiply</b> | 2. How many rows are there?   | <b>Divide</b>   |
| 3. How much does each one cost?   | <b>Divide</b>   | 4. How many are there in all? | <b>Multiply</b> |

Solve.

- Each carton of potato chips has 24 bags. How many bags are there in 8 cartons? **192**
- Sumi bought 5 apples. She paid the clerk 50¢ for them. How much did each apple cost? **10¢**

182

## Using the Exercises

- Discuss the first part of the exercises and have the students give the answers orally. Ask students to add to the list of questions.
- Ask the students to identify the facts and to decide on the operation needed to solve questions 5 and 6.

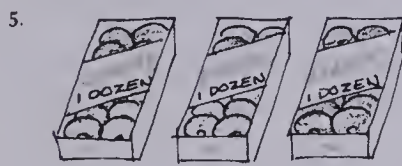


## PRACTICE

Solve.

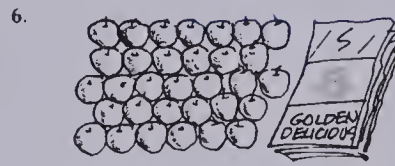
1. Crazy Cat cat food comes in cases which contain 48 tins each. How many tins are there in 8 cases? **384**
2. Boxes of laundry soap are displayed on the supermarket shelves in rows that are 4 boxes deep. Mr. Brent wants to display 28 boxes. How long will each row be? **7**
3. Dodd's Market put cashews on sale for \$3 a can. They sold 245 cans on the first day. How much money did they receive for the cashews? **\$735**
4. The Market sells bunches of fresh flowers. Each bunch costs \$3. They sold \$27 worth of flowers on Thursday. How many bunches did they sell? **9**

Use the facts in the pictures to solve the problems.



How many donuts are there?

**36**

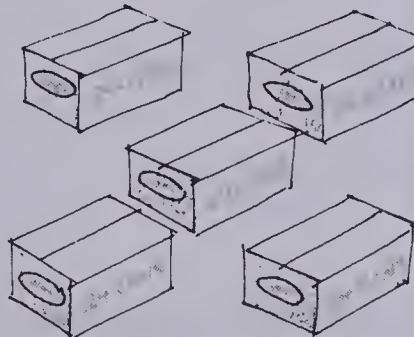
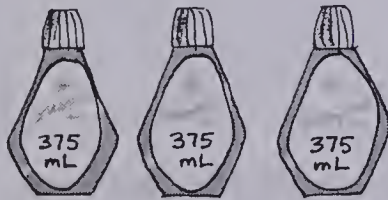


How many bags are needed to pack the apples?

**4**

## Imagine

Make up a story problem for each picture. Solve it.



**Answers will vary.**

183

## Assigning the Practice

Minimum: 1-6

Average: 1-6

Enriched: 1-6

## Reinforcement

Assign *Imagine* at the bottom of page 183. Ask students to read the problems they have written.

## Enrichment

Ask one group of students to use food store advertisements to write story problems. Ask another group of students to make up story problems that involve the work of food store employees. Have the two groups exchange their problems and solve.

## Extra Practice

## Worksheet PS8

Pages 182-183

Solve.

1. An employee stacked 60 boxes of sugar on a shelf. The display was 6 cartons high. How many boxes long was the display? **10**
2. One carton of soap has 108 bars in it. How many bars of soap are there in 4 cartons? **432**
3. Natasha earns \$42.00 a day. How much does she earn in 5 days? **\$210.00**
4. Fred is supposed to stack 40 boxes of cereal in a space 88 cm wide on a shelf. Each box is 22 cm wide. How can Fred arrange the boxes?

**4 x 10**

## Problem Solving Activities

Assign Level 4, Unit 7

# UNIT 8 LESSON 10

## Objective M13

Use estimation in measurement problems.

## Introducing the Lesson

Ask the students to suggest the appropriate units for measuring several things in the classroom or near the school, for example, the width of a poster, the length of the playground, the mass of a piece of chalk.

## Teaching the Lesson

Read the lesson example on page 184 together. Discuss each step of the estimating procedure. Then send all the children to look out the classroom window. Ask them to estimate the height, length, or width of several things of different sizes that can be seen from the window. Have the students write down their estimates. Then send several students outside with metre sticks. Have them hold a metre stick next to each item estimated. Ask the students in the classroom to look and to make a second estimate for each item. Then have the students outside hold two metre sticks (one on top of the other) beside an item whose height is to be estimated, and lay three metre sticks beside an item whose length is to be estimated. Ask the students in the classroom to look and to make a third estimate for each item. Discuss the results and the value of a base as a reference.

## Estimation with Measurement

Sara knows that her father is 2 m tall.  
He stood next to a tree in their yard.  
Sara could see that the tree was about twice as tall as her father.  
Could she estimate the height of the tree?



$$2 \times 2 \text{ m} = 4 \text{ m}$$

To estimate a measurement:

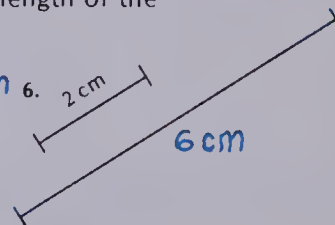
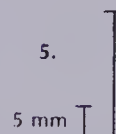
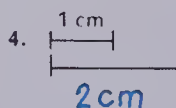
1. Decide what **unit** is suitable.  
centimetre metre kilometre millimetre
2. Pick a **base** you know well.  
the width of your finger  
your father's height  
a metre stick
3. **Compare** the base with the object to be measured.  
How many times bigger is the object?
4. **Estimate** the measure of the object.

### EXERCISES

Which answer is most appropriate?

1. 30 m  
30 cm  
30 mm
2. 1 m  
1 cm  
1 mm
3. 8 m  
8 cm  
8 mm

Compare each pair of lines. Estimate the length of the second line.



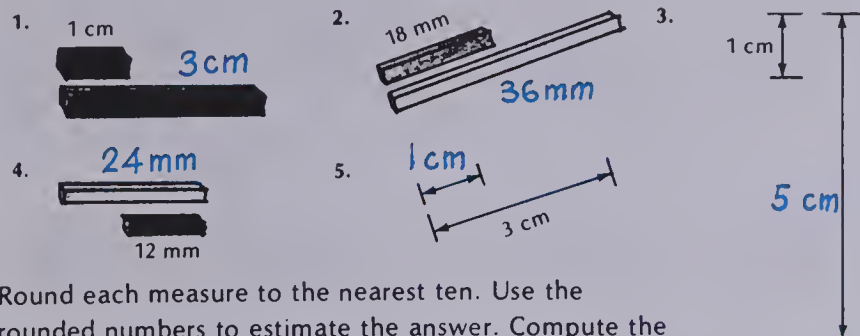
184

## Using the Exercises

- Questions 1 to 3 provide practice in choosing the correct unit. Use items around the classroom for more practice.
- Questions 4 to 6 provide practice in using a base as a source of comparison. Use the width of a hand (about 10 cm) and the width of a book that is about 20 cm to estimate the length of items around the classroom.

## PRACTICE

Compare each pair of figures. Estimate the length of the second figure.



Round each measure to the nearest ten. Use the rounded numbers to estimate the answer. Compute the answer.

6.  $18 \text{ mm} + 42 \text{ mm} = 60 \text{ mm}$       7.  $51 \text{ m} - 37 \text{ m} = 10 \text{ m}$   
 8.  $68 \text{ cm} \times 2 = 140 \text{ cm}$       9.  $62 \text{ km} \times 5 = 300 \text{ km}$

## REVIEW

Multiply.

A42	1. $\begin{array}{r} 400 \\ \times 2 \\ \hline 800 \end{array}$	2. $\begin{array}{r} 300 \\ \times 3 \\ \hline 900 \end{array}$	3. $\begin{array}{r} 600 \\ \times 5 \\ \hline 3000 \end{array}$	4. $\begin{array}{r} 800 \\ \times 6 \\ \hline 4800 \end{array}$	5. $\begin{array}{r} 700 \\ \times 7 \\ \hline 4900 \end{array}$
A43	6. $\begin{array}{r} 324 \\ \times 2 \\ \hline 648 \end{array}$	7. $\begin{array}{r} 732 \\ \times 3 \\ \hline 2196 \end{array}$	8. $\begin{array}{r} 427 \\ \times 3 \\ \hline 1281 \end{array}$	9. $\begin{array}{r} 718 \\ \times 4 \\ \hline 2872 \end{array}$	10. $\begin{array}{r} 804 \\ \times 6 \\ \hline 4824 \end{array}$
A44	11. $\begin{array}{r} 456 \\ \times 4 \\ \hline 1824 \end{array}$	12. $\begin{array}{r} 678 \\ \times 5 \\ \hline 3390 \end{array}$	13. $\begin{array}{r} 765 \\ \times 7 \\ \hline 5355 \end{array}$	14. $\begin{array}{r} 846 \\ \times 6 \\ \hline 5076 \end{array}$	15. $\begin{array}{r} 908 \\ \times 9 \\ \hline 8172 \end{array}$
A45	16. $3 \times 2 \times 4 = 24$	17. $4 \times 3 \times 5 = 60$	18. $5 \times 6 \times 7 = 210$		

185

## Assigning the Practice

Minimum: 1-9

Average: 1-9

Enriched: 1-9

## Review Exercises

Questions	Objective	Pages
1-5	A42	174-175
6-10	A43	176-177
11-15	A44	178-179
16-18	A45	180-181

## Reinforcement

Ask the students to find objects that are about 10 cm, 20 cm, and 50 cm long (or wide). Have the students use them to estimate the height (or length) of a plant, a bookcase, a shelf, and a window.

## Enrichment

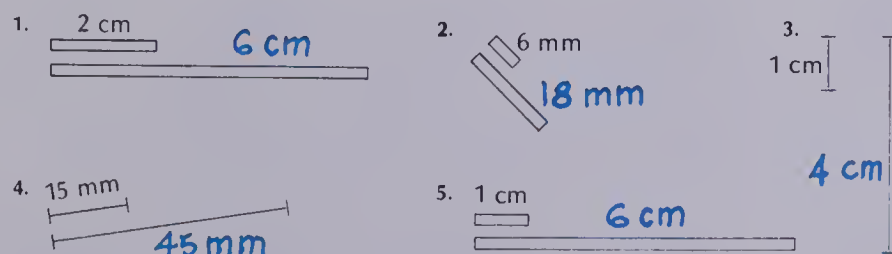
Ask the students to draw a floor plan of the classroom, showing the objects, such as desks and bookcases, that are in it. Have them try to draw everything in proportion to the size chosen for the student desks. Have them do it "by eye", not by measuring.

## Extra Practice

## Worksheet M13

Pages 184-185

Compare the pairs of figures. Estimate the length of the second figure.



Round to the nearest ten. Estimate the answer.

6.  $31 \text{ mm} + 39 \text{ mm} = 70 \text{ mm}$       7.  $83 \text{ cm} - 52 \text{ cm} = 30 \text{ cm}$   
 8.  $98 \text{ m} \times 2 = 200 \text{ m}$       9.  $147 \text{ km} \div 5 = 30 \text{ km}$



Unit 8 Objectives	Test Questions	Pages
A38	1-5	166-167
A39	6-9	168-169
A40	10-14	170-171
A41	15-19	172-173
A42	20-29	174-175
A43	30-34	176-177
A44	35-39	178-179
A45	40-43	180-181
M13	44	184-185

# TEST

# UNIT 8

Compute.

$$\begin{array}{r} 1. \quad 20 \\ \times 3 \\ \hline 60 \end{array} \quad \begin{array}{r} 2. \quad 30 \\ \times 2 \\ \hline 60 \end{array} \quad \begin{array}{r} 3. \quad 70 \\ \times 6 \\ \hline 420 \end{array} \quad \begin{array}{r} 4. \quad 50 \\ \times 7 \\ \hline 350 \end{array} \quad \begin{array}{r} 5. \quad 90 \\ \times 8 \\ \hline 720 \end{array}$$

$$6. \quad 5 \times (3 + 2) = 25 \quad 7. \quad 6 \times (3 + 4) = 42$$

$$8. \quad 7 \times (5 + 4) = 63 \quad 9. \quad 8 \times (50 + 30) = 640$$

$$\begin{array}{r} 10. \quad 34 \\ \times 2 \\ \hline 68 \end{array} \quad \begin{array}{r} 11. \quad 23 \\ \times 3 \\ \hline 69 \end{array} \quad \begin{array}{r} 12. \quad 52 \\ \times 4 \\ \hline 208 \end{array} \quad \begin{array}{r} 13. \quad 71 \\ \times 6 \\ \hline 426 \end{array} \quad \begin{array}{r} 14. \quad 82 \\ \times 3 \\ \hline 246 \end{array}$$

$$\begin{array}{r} 15. \quad 46 \\ \times 3 \\ \hline 138 \end{array} \quad \begin{array}{r} 16. \quad 18 \\ \times 5 \\ \hline 90 \end{array} \quad \begin{array}{r} 17. \quad 57 \\ \times 6 \\ \hline 342 \end{array} \quad \begin{array}{r} 18. \quad 78 \\ \times 7 \\ \hline 546 \end{array} \quad \begin{array}{r} 19. \quad 94 \\ \times 8 \\ \hline 752 \end{array}$$

$$\begin{array}{r} 20. \quad 300 \\ \times 2 \\ \hline 600 \end{array} \quad \begin{array}{r} 21. \quad 100 \\ \times 4 \\ \hline 400 \end{array} \quad \begin{array}{r} 22. \quad 500 \\ \times 6 \\ \hline 3000 \end{array} \quad \begin{array}{r} 23. \quad 900 \\ \times 5 \\ \hline 4500 \end{array} \quad \begin{array}{r} 24. \quad 800 \\ \times 6 \\ \hline 4800 \end{array}$$

Round the first number. Estimate the answer.

$$\begin{array}{r} 25. \quad 31 \\ \times 8 \\ \hline 240 \end{array} \quad \begin{array}{r} 26. \quad 49 \\ \times 9 \\ \hline 250 \end{array} \quad \begin{array}{r} 27. \quad 65 \\ \times 6 \\ \hline 390 \end{array} \quad \begin{array}{r} 28. \quad 324 \\ \times 8 \\ \hline 2560 \end{array} \quad \begin{array}{r} 29. \quad 678 \\ \times 7 \\ \hline 4760 \end{array}$$

Multiply.

$$\begin{array}{r} 30. \quad 123 \\ \times 3 \\ \hline 369 \end{array} \quad \begin{array}{r} 31. \quad 402 \\ \times 4 \\ \hline 1608 \end{array} \quad \begin{array}{r} 32. \quad 516 \\ \times 5 \\ \hline 2580 \end{array} \quad \begin{array}{r} 33. \quad 837 \\ \times 2 \\ \hline 1674 \end{array} \quad \begin{array}{r} 34. \quad 916 \\ \times 6 \\ \hline 5496 \end{array}$$

$$\begin{array}{r} 35. \quad 257 \\ \times 3 \\ \hline 771 \end{array} \quad \begin{array}{r} 36. \quad 438 \\ \times 4 \\ \hline 1752 \end{array} \quad \begin{array}{r} 37. \quad 695 \\ \times 5 \\ \hline 3475 \end{array} \quad \begin{array}{r} 38. \quad 740 \\ \times 9 \\ \hline 6660 \end{array} \quad \begin{array}{r} 39. \quad 868 \\ \times 8 \\ \hline 6944 \end{array}$$

$$40. \quad 3 \times 2 \times 2 = 12 \quad 41. \quad 2 \times 4 \times 5 = 40 \quad 42. \quad 3 \times 4 \times 3 = 36 \quad 43. \quad 5 \times 7 \times 8 = 280$$

44. Jane's father is 1.9 m tall. He is standing beside a tree about three times as tall. About how tall is the tree? 5.7 m

## Post-test

## Unit 8

Compute.

$$\begin{array}{r} 1. \quad 40 \\ \times 3 \\ \hline 120 \end{array} \quad \begin{array}{r} 2. \quad 50 \\ \times 7 \\ \hline 350 \end{array} \quad \begin{array}{r} 3. \quad 80 \\ \times 6 \\ \hline 480 \end{array} \quad \begin{array}{r} 4. \quad 40 \\ \times 9 \\ \hline 360 \end{array} \quad \begin{array}{r} 5. \quad 90 \\ \times 7 \\ \hline 630 \end{array}$$

$$6. \quad 5 \times (7 + 2) = 45 \quad 7. \quad 6 \times (3 + 5) = 48$$

$$8. \quad 7 \times (10 + 4) = 98 \quad 9. \quad 4 \times (60 + 30) = 360$$

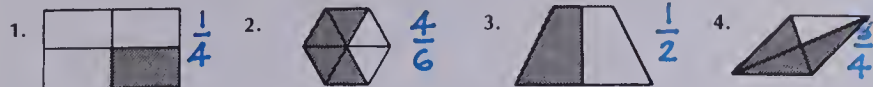
$$\begin{array}{r} 10. \quad 42 \\ \times 3 \\ \hline 126 \end{array} \quad \begin{array}{r} 11. \quad 84 \\ \times 2 \\ \hline 168 \end{array} \quad \begin{array}{r} 12. \quad 51 \\ \times 9 \\ \hline 459 \end{array} \quad \begin{array}{r} 13. \quad 64 \\ \times 2 \\ \hline 128 \end{array} \quad \begin{array}{r} 14. \quad 72 \\ \times 4 \\ \hline 288 \end{array}$$

$$\begin{array}{r} 15. \quad 36 \\ \times 6 \\ \hline 216 \end{array} \quad \begin{array}{r} 16. \quad 48 \\ \times 4 \\ \hline 192 \end{array} \quad \begin{array}{r} 17. \quad 92 \\ \times 8 \\ \hline 736 \end{array} \quad \begin{array}{r} 18. \quad 19 \\ \times 7 \\ \hline 133 \end{array} \quad \begin{array}{r} 19. \quad 65 \\ \times 5 \\ \hline 325 \end{array}$$

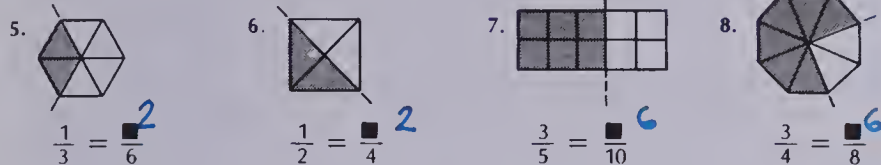
$$\begin{array}{r} 20. \quad 200 \\ \times 4 \\ \hline 800 \end{array} \quad \begin{array}{r} 21. \quad 400 \\ \times 6 \\ \hline 2400 \end{array} \quad \begin{array}{r} 22. \quad 700 \\ \times 7 \\ \hline 4900 \end{array} \quad \begin{array}{r} 23. \quad 500 \\ \times 9 \\ \hline 4500 \end{array} \quad \begin{array}{r} 24. \quad 600 \\ \times 8 \\ \hline 4800 \end{array}$$

# DECIMALS

What fraction of the whole is shaded?



Write the equivalent fraction.



Copy each pair of numbers. Use  $<$ ,  $=$ , or  $>$  to make a true statement.

9.  $\frac{4}{6} \blacksquare \frac{5}{6}$  10.  $\frac{4}{10} \blacksquare \frac{2}{10}$  11.  $\frac{3}{3} \blacksquare \frac{1}{3}$  12.  $\frac{2}{5} \blacksquare \frac{5}{5}$

What fraction of the set is shaded?



Write as a decimal.

16.  $\frac{5}{10}$  0.5 17.  $\frac{1}{10}$  0.1 18.  $\frac{10}{10}$  1.0 19.  $\frac{17}{10}$  1.7 20.  $\frac{13}{10}$  1.3

Copy and complete.

21. 90 cm =  $\blacksquare$  dm 22. 0.6 m =  $\blacksquare$  dm 23. 2 dm =  $\blacksquare$  cm

Add or subtract.

24.  $\begin{array}{r} 45.3 \\ + 18.5 \\ \hline 63.8 \end{array}$  25.  $\begin{array}{r} 290.6 \\ + 57.8 \\ \hline 348.4 \end{array}$  26.  $\begin{array}{r} 64.3 \\ - 9.7 \\ \hline 54.6 \end{array}$  27.  $\begin{array}{r} 92.0 \\ - 35.1 \\ \hline 56.9 \end{array}$  28.  $\begin{array}{r} 481.4 \\ - 92.7 \\ \hline 388.7 \end{array}$

Round the first number. Estimate the answer.

25.  $\begin{array}{r} 53 \\ \times 3 \\ \hline 150 \end{array}$  26.  $\begin{array}{r} 68 \\ \times 4 \\ \hline 280 \end{array}$  27.  $\begin{array}{r} 19 \\ \times 6 \\ \hline 120 \end{array}$  28.  $\begin{array}{r} 188 \\ \times 7 \\ \hline 1400 \end{array}$  29.  $\begin{array}{r} 407 \\ \times 9 \\ \hline 3600 \end{array}$

Multiply.

30.  $\begin{array}{r} 619 \\ \times 4 \\ \hline 2476 \end{array}$  31.  $\begin{array}{r} 535 \\ \times 2 \\ \hline 1070 \end{array}$  32.  $\begin{array}{r} 424 \\ \times 3 \\ \hline 1272 \end{array}$  33.  $\begin{array}{r} 816 \\ \times 5 \\ \hline 4080 \end{array}$  34.  $\begin{array}{r} 737 \\ \times 2 \\ \hline 1474 \end{array}$   
35.  $\begin{array}{r} 364 \\ \times 5 \\ \hline 1820 \end{array}$  36.  $\begin{array}{r} 246 \\ \times 4 \\ \hline 984 \end{array}$  37.  $\begin{array}{r} 754 \\ \times 4 \\ \hline 3016 \end{array}$  38.  $\begin{array}{r} 671 \\ \times 9 \\ \hline 6039 \end{array}$  39.  $\begin{array}{r} 936 \\ \times 6 \\ \hline 5616 \end{array}$   
40.  $3 \times 5 \times 4 = 60$  41.  $2 \times 4 \times 7 = 56$   
42.  $4 \times 6 \times 3 = 72$  43.  $8 \times 4 \times 2 = 64$

44. Maria measured the window in her kitchen. It is 83.7 cm by 67.7 cm. Estimate the perimeter of the window to the nearest 10 cm.

300 cm

# UNIT 9

## Division

Theme: A bakery

Lesson	Objective		Pages
Preview		Subtraction	189
1	A46	Divide a two-digit dividend by a one-digit divisor with a one-digit quotient and no remainder.	190-191
2	A47	Divide a two-digit dividend by a one-digit divisor with a one-digit quotient and a remainder.	192-193
3	A48	Divide a multiple of 10 by a one-digit divisor with no remainder.	194-195
4	A49	Divide a two-digit dividend by a one-digit divisor where each digit of the dividend is a multiple of the divisor (no remainder).	196-197
5	A50	Divide a two-digit dividend by a one-digit divisor where the first digit of the dividend is not a multiple of the divisor (no remainder).	198-199
6	A51	Divide a two-digit dividend by a one-digit divisor with a two-digit quotient and a remainder.	200-201
7	A52	Divide a three-digit dividend by a one-digit divisor with a two-digit quotient where the first two digits of the dividend are a multiple of the divisor (no remainder).	202-203
8	A53	Divide a three-digit dividend by a one-digit divisor with a two-digit quotient where the first two digits of the dividend are not a multiple of the divisor (no remainder).	204-205
9	A54	Divide a three-digit dividend by a one-digit divisor with a two-digit quotient and a remainder.	206-207
10	PS9	Identify the correct operation in a problem-solving situation.	208-209
Test		Division	210
Review		Multiplication	211



# About This Unit

This unit provides the first introduction to long division in the Houghton Mifflin Mathematics program. The divisor algorithm used here is best illustrated by measurement division problems (see the introduction to Unit 6). However, both measurement and partitive division problems must be presented. Students should realize, after completing Unit 6, that the algorithm is a means to an end. The measurement algorithm serves equally well in solving both types of division problems.

Whenever possible, division examples should be modelled with concrete materials to parallel the algorithm.

Students who are having difficulty with basic facts may be helped by using a temporary crutch such as a table. It may help some students to learn the algorithm if they use the acronym EMS (estimate, multiply, subtract) for each cycle. It is very important that students learn to check their work using multiplication.

The lessons in this unit are arranged in a logical, step-by-step sequence in order to build the skills gradually. This method helps increase confidence in the students and should give maximum results. As well, it allows for reasonable ease in diagnosing individual difficulties. The skills in this unit are limited to division of three-digit dividends by one-digit divisors with two-digit quotients. That is, the skills are limited to two applications of the EMS cycle.

# Ideas

Use base ten blocks repeatedly in this unit to illustrate the division algorithm. The measurement algorithm was chosen because it lends itself to this approach.



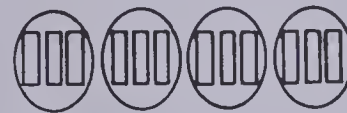
$$4 \overline{)136}$$

$$136 = 1 \text{ hundred } 3 \text{ tens } 6 \text{ ones} \\ = 13 \text{ tens } 6 \text{ ones}$$

$$13 \text{ tens} \div 4 = 3 \text{ tens, with 1 ten left over}$$

$$\begin{array}{r} 3 \leftarrow 3 \text{ tens} \\ 4 \overline{)136} \\ \underline{-12} \end{array}$$

We subtract 12 tens from the original pile. 1  $\leftarrow$  ten left over



$$1 \text{ ten } 6 \text{ ones} = 16 \text{ ones}$$

$$16 \leftarrow 16 \text{ ones}$$

$$\begin{array}{l} 16 \div 4 = 4 \end{array}$$

$$16 \div 4 = 4$$

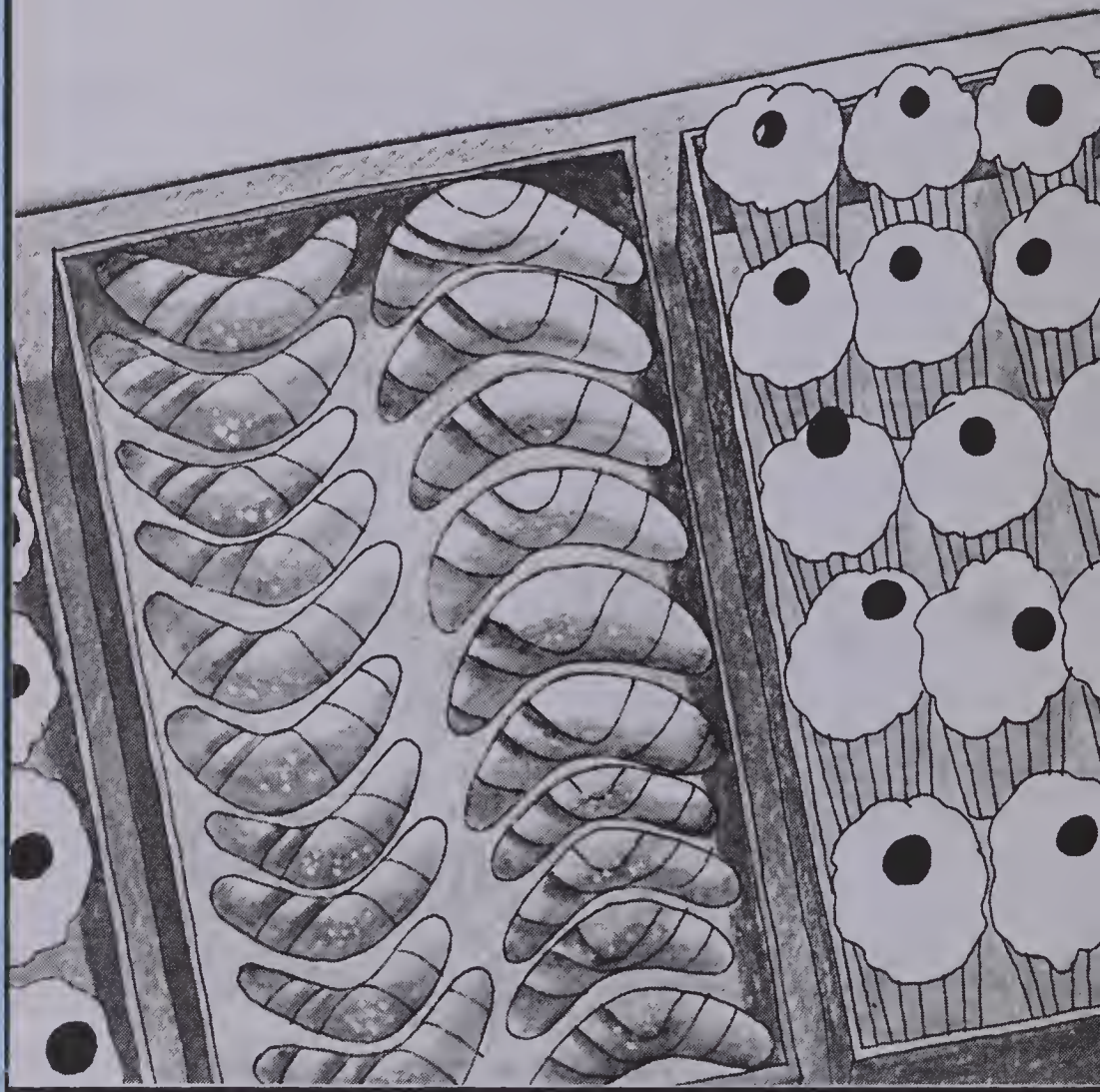


$$\begin{array}{r} 34 \\ 4 \overline{)136} \\ \underline{-12} \\ 16 \end{array}$$

$\leftarrow$  We subtract 16 ones from the pile.

# UNIT 9

## DIVISION



Unit 9 Objective	Test Questions	Pages
A46	1-5	190-191
A47	6-10	192-193
A48	11-15	194-195
A49	16-20	196-197
A50	21-25	198-199
A51	26-30	200-201
A52	31-35	202-203
A53	36-40	204-205
A54	41-45	206-207

### Pretest

- $3 \overline{)27}$   $\overset{9}{}$
- $2 \overline{)16}$   $\overset{8}{}$
- $8 \overline{)48}$   $\overset{6}{}$
- $7 \overline{)49}$   $\overset{7}{}$
- $9 \overline{)36}$   $\overset{4}{}$
- $4 \overline{)19}$   $\overset{4R3}{}$
- $5 \overline{)37}$   $\overset{7R2}{}$
- $3 \overline{)25}$   $\overset{8R1}{}$
- $9 \overline{)57}$   $\overset{6R3}{}$
- $6 \overline{)32}$   $\overset{5R2}{}$
- $2 \overline{)40}$   $\overset{20}{}$
- $3 \overline{)90}$   $\overset{30}{}$
- $6 \overline{)120}$   $\overset{60}{}$
- $7 \overline{)140}$   $\overset{20}{}$
- $5 \overline{)250}$   $\overset{50}{}$
- $4 \overline{)48}$   $\overset{12}{}$
- $2 \overline{)66}$   $\overset{33}{}$
- $7 \overline{)77}$   $\overset{11}{}$
- $3 \overline{)96}$   $\overset{32}{}$
- $4 \overline{)84}$   $\overset{21}{}$

### Unit 9



# Subtraction

Do this subtraction quiz.  
Can you discover a secret way to  
check the answers for each row?



## UNIT 4 PREVIEW

### Suggestions

In order to carry out long division successfully, three prerequisite skills are required: estimation, multiplication, and subtraction. At this stage, the estimation step is fairly simple, since with one-digit divisors each step is limited to a basic division fact with a remainder. It may be advisable to review basic division facts through a flash card drill or by assigning the *Looking Back* on page 163. Having just completed Unit 8, students' multiplication skills should be sharp.

### About the Page

Page 189 provides a simple subtraction review. The examples are limited to types of subtraction students are likely to encounter in doing a division question. The exercises are self-checking: the fourth answer in each row is the sum of the first three answers.

21.  $2 \overline{)32}$   $\frac{16}{}$

22.  $6 \overline{)72}$   $\frac{12}{}$

23.  $4 \overline{)72}$   $\frac{18}{}$

24.  $8 \overline{)96}$   $\frac{12}{}$

25.  $5 \overline{)85}$   $\frac{17}{}$

26.  $3 \overline{)49}$   $\frac{16R1}{}$

27.  $6 \overline{)88}$   $\frac{14R4}{}$

28.  $2 \overline{)97}$   $\frac{48R1}{}$

29.  $7 \overline{)85}$   $\frac{12R1}{}$

30.  $6 \overline{)75}$   $\frac{12R3}{}$

31.  $3 \overline{)153}$   $\frac{51}{}$

32.  $6 \overline{)126}$   $\frac{21}{}$

33.  $5 \overline{)355}$   $\frac{71}{}$

34.  $2 \overline{)188}$   $\frac{94}{}$

35.  $4 \overline{)168}$   $\frac{42}{}$

36.  $2 \overline{)174}$   $\frac{87}{}$

37.  $6 \overline{)390}$   $\frac{65}{}$

38.  $5 \overline{)285}$   $\frac{57}{}$

39.  $9 \overline{)396}$   $\frac{44}{}$

40.  $8 \overline{)288}$   $\frac{36}{}$

41.  $6 \overline{)241}$   $\frac{40R1}{}$

42.  $3 \overline{)259}$   $\frac{86R1}{}$

43.  $6 \overline{)437}$   $\frac{72R5}{}$

44.  $9 \overline{)479}$   $\frac{53R2}{}$

45.  $5 \overline{)386}$   $\frac{77R1}{}$



# UNIT 9 LESSON 1

## Objective A46

Divide a two-digit dividend by a one-digit divisor with a one-digit quotient and no remainder.

## Introducing the Lesson

Review everyday uses of division: the sharing of food, drink, money, and other material things; the packing of items into cartons; the seating of people; and the division of measurements for mass, length, time, and capacity. Include examples arising from the operation of a bakery.

## Teaching the Lesson

The examples in this lesson all are basic facts. The purpose of the lesson is to establish the formal write-up for the division algorithm and to teach its meaning. Use concrete materials (money, bottle caps, etc.) to model the algorithm, if necessary.

The answer you get when you divide is called the *quotient*. Use a package that contains 12 cookies. Two people share the cookies. How many will each get?

**Estimate:** 
$$\begin{array}{r} 6 \\ 2 \overline{)12} \end{array}$$
 2 times what makes 12?  
Get as close as you can to 12.  
 $2 \times 6 = 12$

**Multiply:** 
$$\begin{array}{r} 6 \\ 2 \overline{)12} \\ \underline{12} \end{array}$$

Put the answer under the number that you are dividing so that you can:

**Subtract:** 
$$\begin{array}{r} 6 \\ 2 \overline{)12} \\ \underline{-12} \\ 0 \end{array}$$
 Each person would get 6 cookies.

Stress that the routine is complete when you get a zero after subtracting. In these examples, if you do not get a zero, you must try again.

$$\begin{array}{r} 5 \\ 2 \overline{)12} \\ \underline{10} \end{array}$$
 2 ← Not zero. Try again.

$$\begin{array}{r} 7 \\ 2 \overline{)12} \\ \underline{-14} \end{array}$$
 ← Too large. We can't subtract. Try again.

## Division

Mel made 15 cakes at Landy's Bakery on Monday afternoon. He can make 5 cakes in an hour. How many hours did it take him to make 15 cakes?

$$15 \div 5 = \blacksquare \quad \text{or} \quad 5 \overline{)15}$$

There is a way to work out your answer.

$$\begin{array}{r} 3 \\ 5 \overline{)15} \\ \underline{-15} \\ 0 \end{array}$$

Estimate how many fives are in 15.  
Multiply  $3 \times 5$ .  
Subtract  $15 - 15$ .

It took Mel 3 hours to make 15 cakes.  
3 is the **quotient**



## EXERCISES

Copy and complete each division.

- $$\begin{array}{r} \blacksquare 6 \\ 2 \overline{)12} \\ \underline{-12} \\ 0 \end{array}$$
- $$\begin{array}{r} \blacksquare 6 \\ 3 \overline{)18} \\ \underline{-18} \\ 0 \end{array}$$
- $$\begin{array}{r} \blacksquare 5 \\ 4 \overline{)20} \\ \underline{-20} \\ 0 \end{array}$$
- $$\begin{array}{r} \blacksquare 6 \\ 5 \overline{)30} \\ \underline{-30} \\ 0 \end{array}$$
- $$\begin{array}{r} \blacksquare 7 \\ 6 \overline{)42} \\ \underline{-42} \\ 0 \end{array}$$
- $$\begin{array}{r} 8 \\ 2 \overline{)16} \\ \underline{-16} \\ 0 \end{array}$$
- $$\begin{array}{r} 8 \\ 3 \overline{)24} \\ \underline{-24} \\ 0 \end{array}$$
- $$\begin{array}{r} 8 \\ 4 \overline{)32} \\ \underline{-32} \\ 0 \end{array}$$
- $$\begin{array}{r} 4 \\ 7 \overline{)28} \\ \underline{-28} \\ 0 \end{array}$$
- $$\begin{array}{r} 7 \\ 8 \overline{)56} \\ \underline{-56} \\ 0 \end{array}$$
- $$\begin{array}{r} 5 \\ 2 \overline{)10} \end{array}$$
- $$\begin{array}{r} 9 \\ 3 \overline{)27} \end{array}$$
- $$\begin{array}{r} 7 \\ 5 \overline{)35} \end{array}$$
- $$\begin{array}{r} 6 \\ 6 \overline{)36} \end{array}$$
- $$\begin{array}{r} 5 \\ 9 \overline{)45} \end{array}$$
- $$\begin{array}{r} 7 \\ 2 \overline{)14} \end{array}$$
- $$\begin{array}{r} 6 \\ 4 \overline{)24} \end{array}$$
- $$\begin{array}{r} 5 \\ 5 \overline{)25} \end{array}$$
- $$\begin{array}{r} 9 \\ 6 \overline{)54} \end{array}$$
- $$\begin{array}{r} 9 \\ 8 \overline{)72} \end{array}$$

## Using the Exercises

- The exercises range from partially completed ones to examples the students do completely themselves in order to provide the formal write-up of the algorithm. Be sure students are carrying through with the write-up and not just writing the quotients.

## PRACTICE

Divide.

- |                        |                        |                        |                        |                        |
|------------------------|------------------------|------------------------|------------------------|------------------------|
| 1. $5 \overline{)5}$   | 2. $2 \overline{)8}$   | 3. $3 \overline{)9}$   | 4. $1 \overline{)6}$   | 5. $4 \overline{)8}$   |
| 6. $2 \overline{)12}$  | 7. $3 \overline{)21}$  | 8. $4 \overline{)32}$  | 9. $5 \overline{)45}$  | 10. $6 \overline{)54}$ |
| 11. $7 \overline{)56}$ | 12. $4 \overline{)36}$ | 13. $8 \overline{)64}$ | 14. $5 \overline{)40}$ | 15. $9 \overline{)72}$ |
| 16. $2 \overline{)6}$  | 17. $5 \overline{)0}$  | 18. $6 \overline{)6}$  | 19. $4 \overline{)20}$ | 20. $5 \overline{)35}$ |
| 21. $6 \overline{)60}$ | 22. $7 \overline{)63}$ | 23. $8 \overline{)56}$ | 24. $9 \overline{)81}$ | 25. $6 \overline{)42}$ |
| 26. $4 \overline{)28}$ | 27. $7 \overline{)42}$ | 28. $5 \overline{)30}$ | 29. $9 \overline{)63}$ | 30. $8 \overline{)72}$ |

Solve.

- Sonia works 3 hours in the bakery in the evening. Last week she worked 18 hours. How many evenings did she work? **6**
- A bakery packs bran muffins 8 to a package. Ted wants 32 muffins. How many packages should he buy? **4**
- Butter tarts are packed in trays of 6. There are 48 tarts. How many trays can be filled? **8**

## USING THE CALCULATOR

Which of the numbers below are exactly divisible by 9? Use a calculator to find out. Then find the sum of the digits of each of the numbers.

45 **5**      32      18 **2**      64  
72 **8**      54 **6**      56      63 **7**      15

Find more numbers divisible by 9.

Can you state a rule for all numbers divisible by 9?

Sum of digits adds to 9.

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## Assigning the Practice

Minimum: 1-15, 31

Average: 16-32

Enriched: 21-33

## Reinforcement

1. Provide a list of division problems in the form  $40 \div 8$ . Play a game at the chalkboard. The first player writes the problem using the division box  $8 \overline{)40}$ . The second player writes in an estimate of the answer. The third player does the multiplying step. The fourth player subtracts.

2. For those who are having difficulty, use examples that require only one table at a time. Start with 2:

$$16 \div 2, 14 \div 2, 8 \div 2$$

When that table has been mastered, have them try examples using the 5 times table:

$$5 \overline{)30} \quad 5 \overline{)25} \quad 5 \overline{)35}$$

Then try 3 and 4.

It's the process of division we want them to understand, so they should begin with familiar tables. When the process has become familiar, they can try the harder tables, such as 7, 8, and 9.

## Enrichment

Assign *Using the Calculator* on page 191. A number is divisible by 9 if the sum of its digits is 9 (or a multiple of 9). In all the numbers divisible by 9 the sum of the digits is 9.

## Extra Practice

## Worksheet A46

Pages 190-191

Divide.

- |                        |                        |                        |                        |                        |
|------------------------|------------------------|------------------------|------------------------|------------------------|
| 1. $2 \overline{)4}$   | 2. $3 \overline{)6}$   | 3. $5 \overline{)5}$   | 4. $6 \overline{)0}$   | 5. $4 \overline{)20}$  |
| 6. $6 \overline{)42}$  | 7. $8 \overline{)72}$  | 8. $7 \overline{)56}$  | 9. $3 \overline{)27}$  | 10. $8 \overline{)32}$ |
| 11. $5 \overline{)45}$ | 12. $9 \overline{)54}$ | 13. $8 \overline{)64}$ | 14. $4 \overline{)36}$ | 15. $6 \overline{)36}$ |
| 16. $7 \overline{)63}$ | 17. $8 \overline{)40}$ | 18. $5 \overline{)35}$ | 19. $7 \overline{)49}$ | 20. $6 \overline{)54}$ |

## Objective A47

Divide a two-digit dividend by a one-digit divisor with a one-digit quotient and a remainder.

## Introducing the Lesson

Ask three students to share seven cookies evenly. They are not allowed to break the cookies. Dole out the cookies one at a time to each student. Use up 3 cookies, then 3 more for the total of 6. What happens? One cookie is left over. Point out that, in doing division, answers often do not work out evenly.

## Teaching the Lesson

Use concrete materials to solve the lesson example before discussing the division algorithm. Then set up the divisor and work through the algorithm.

Estimate:	Multiply:	Subtract:
$\begin{array}{r} 8 \\ 2 \overline{)17} \end{array}$	$\begin{array}{r} 8 \\ 2 \overline{)17} \\ \underline{16} \end{array}$	$\begin{array}{r} 8 \\ 2 \overline{)17} \\ \underline{-16} \\ 1 \end{array}$
About 8 twos in 17.	$8 \times 2 = 16$	1 left over.

The left-over is called the *remainder*. The remainder is shown like this. 8 R1

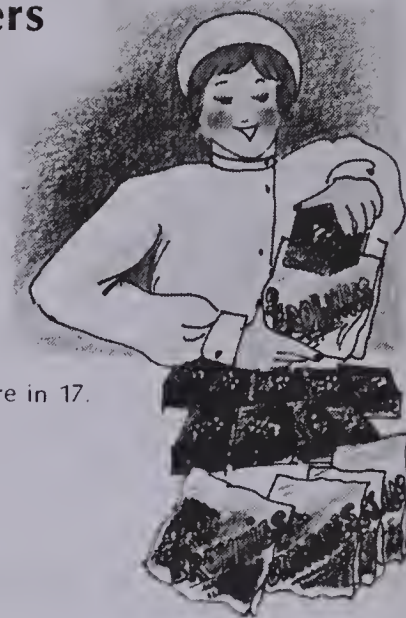
What happens when the estimate is wrong?

$\begin{array}{r} 7 \\ 2 \overline{)17} \\ \underline{-14} \\ 3 \end{array}$	Larger than the divisor. Try again.	$\begin{array}{r} 9 \\ 2 \overline{)17} \\ \underline{-18} \end{array}$	Too large. Can't subtract. Try again.
--	-------------------------------------	---	---------------------------------------

The remainder should be less than the divisor. Get an estimate as close as possible to the dividend without going over. Students having difficulty estimating should have lots of opportunities to try numbers—with a multiplication table at hand, if necessary.

## Division with Remainders

Mary is making snack packs at the bakery. She puts 2 brownies in each snack pack. There are 17 brownies. How many snack packs can she make?



$$17 \div 2 = \square \quad \text{or} \quad 2 \overline{)17}$$

Write each step.

$$\begin{array}{r} 8 \\ 2 \overline{)17} \\ \underline{-16} \\ 1 \end{array}$$

Estimate how many twos are in 17.  
Multiply  $8 \times 2$ .  
Subtract  $17 - 16$ .

Mary can make 8 snack packs. There will be 1 left over.

1 is the **remainder**.

8 is the **quotient**.

Write R1 beside the quotient. 8R1

## EXERCISES

Copy and complete each division.

- $2 \overline{)10}$
- $2 \overline{)11}$
- $2 \overline{)12}$
- $3 \overline{)15}$
- $3 \overline{)16}$
- $3 \overline{)17}$
- $3 \overline{)18}$
- $5 \overline{)25}$
- $5 \overline{)26}$
- $5 \overline{)28}$
- $5 \overline{)30}$
- $4 \overline{)17}$
- $4 \overline{)22}$
- $6 \overline{)37}$
- $6 \overline{)39}$
- $4 \overline{)29}$
- $5 \overline{)31}$
- $8 \overline{)66}$
- $6 \overline{)55}$
- $7 \overline{)51}$

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## Using the Exercises

- The exercises range from partially worked examples to ones the students must work completely. Be sure they are completing all the steps including writing the remainder in final form.
- Questions 1 to 3, 4 to 7, and 8 to 9 have the same divisor with the dividend increasing by 1 from an example with no remainder. Questions 11 to 20 are random examples.
- Show the students how to check their answers.

$$\begin{array}{r} 8 \text{ R}1 \\ 2 \overline{)17} \end{array}$$

Multiply the *quotient* by the divisor.  $8 \times 2 = 16$   
Add the *remainder*.  
 $16 + 1 = 17$  ← **dividend**

Do a few other examples before working through the exercises.



## PRACTICE

Divide

- |                                   |                                   |                                   |                                   |                                   |
|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| 1. $2 \overline{)5}$ <b>2R1</b>   | 2. $3 \overline{)8}$ <b>2R2</b>   | 3. $4 \overline{)7}$ <b>1R3</b>   | 4. $5 \overline{)9}$ <b>1R4</b>   | 5. $6 \overline{)8}$ <b>1R2</b>   |
| 6. $2 \overline{)11}$ <b>5R1</b>  | 7. $3 \overline{)23}$ <b>7R2</b>  | 8. $4 \overline{)33}$ <b>8R1</b>  | 9. $5 \overline{)30}$ <b>6</b>    | 10. $6 \overline{)41}$ <b>6R5</b> |
| 11. $7 \overline{)20}$ <b>2R6</b> | 12. $4 \overline{)38}$ <b>9R2</b> | 13. $8 \overline{)44}$ <b>5R4</b> | 14. $6 \overline{)57}$ <b>9R3</b> | 15. $9 \overline{)59}$ <b>6R5</b> |
| 16. $5 \overline{)8}$ <b>1R3</b>  | 17. $3 \overline{)21}$ <b>7</b>   | 18. $2 \overline{)7}$ <b>3R1</b>  | 19. $3 \overline{)4}$ <b>1R1</b>  | 20. $4 \overline{)6}$ <b>1R2</b>  |
| 21. $5 \overline{)11}$ <b>2R1</b> | 22. $8 \overline{)62}$ <b>7R6</b> | 23. $9 \overline{)80}$ <b>8R8</b> | 24. $2 \overline{)15}$ <b>7R1</b> | 25. $3 \overline{)25}$ <b>8R1</b> |
| 26. $4 \overline{)27}$ <b>6R3</b> | 27. $5 \overline{)43}$ <b>8R3</b> | 28. $6 \overline{)40}$ <b>6R4</b> | 29. $7 \overline{)35}$ <b>5</b>   | 30. $4 \overline{)34}$ <b>8R2</b> |
| 31. $3 \overline{)7}$ <b>2R1</b>  | 32. $8 \overline{)69}$ <b>8R5</b> | 33. $5 \overline{)7}$ <b>1R2</b>  | 34. $9 \overline{)70}$ <b>7R7</b> | 35. $8 \overline{)63}$ <b>7R7</b> |

Solve.

36. Landy's Bakery has 50 kg of flour. A batch of bread takes 8 kg of flour. How many batches of bread can they make? How much flour will be left? **6 batches, 2 kg left**
37. A bakery puts 2 jelly donuts in a snack pack. They have 19 jelly donuts. How many donut snack packs can they make? How many will be left over? **9 packs, 1 left**
38. Best Bakery had 56 cupcakes to pack in ready-to-go cartons. Tony filled 9 cartons and had 2 cupcakes left over. How many did he put in each carton? **6**

## Important Tips

Eva works at a snack shop for \$3 an hour. She earned \$37 last week, but that included \$10 in tips. How many hours did she work? **9 hours**



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## Assigning the Practice

Minimum: 1-20, 36

Average: 16-37

Enriched: 21-38

## Reinforcement

1. Write on the chalkboard some division problems similar to the ones given in this lesson. Play a game where the first player writes an estimate of the answer. The second player does the multiplying step. The third player subtracts and writes the remainder in the answer.

2. For students who are having difficulty, use only 2 as the divisor.

This is one they are familiar with.

$$\begin{array}{r} 9 \\ 2 \overline{)19} \end{array}$$

Estimate: count by 2's.  
Get as close to 19 as you can without going over.

$$\begin{array}{r} 9 \\ 2 \overline{)19} \\ \underline{18} \end{array}$$

Multiply:  $2 \times 9 = 18$

$$\begin{array}{r} 9 \\ 2 \overline{)19} \\ \underline{-18} \\ 1 \end{array}$$

Subtract:  $19 - 18 = 1$   
Quotient is 9.  
Remainder is 1.

When the students can work through examples with 2 as the divisor, have them try 5 as the divisor. These are the tables the students know best.

It is important not to frustrate them at first with the harder tables. As proficiency builds they can try the 3 and 4.

## Enrichment

Assign *Important Tips* on page 193. This is an example of a two-step problem. Students may be inclined to try to divide 37 by 3. Help them out by asking questions. How much were the tips? How much did she make altogether? How much did she make before getting the tips?

## Extra Practice

## Worksheet A47

Pages 192-193

- |                                   |                                   |                                   |                                   |                                   |
|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| 1. $2 \overline{)9}$ <b>4R1</b>   | 2. $3 \overline{)8}$ <b>2R2</b>   | 3. $4 \overline{)9}$ <b>2R1</b>   | 4. $5 \overline{)9}$ <b>1R4</b>   | 5. $3 \overline{)22}$ <b>7R1</b>  |
| 6. $4 \overline{)29}$ <b>7R1</b>  | 7. $5 \overline{)28}$ <b>5R3</b>  | 8. $6 \overline{)23}$ <b>3R5</b>  | 9. $8 \overline{)50}$ <b>6R2</b>  | 10. $6 \overline{)59}$ <b>9R5</b> |
| 11. $7 \overline{)54}$ <b>7R5</b> | 12. $9 \overline{)85}$ <b>9R4</b> | 13. $7 \overline{)60}$ <b>8R4</b> | 14. $5 \overline{)37}$ <b>7R2</b> | 15. $4 \overline{)37}$ <b>9R1</b> |
| 16. $4 \overline{)38}$ <b>9R2</b> | 17. $6 \overline{)44}$ <b>7R2</b> | 18. $9 \overline{)70}$ <b>7R7</b> | 19. $5 \overline{)47}$ <b>9R2</b> | 20. $8 \overline{)70}$ <b>8R6</b> |

# UNIT 9 LESSON 3

## Objective A48

Divide a multiple of 10 by a one-digit divisor with no remainder.

## Introducing the Lesson

Discuss everyday examples of division involving sharing. Record examples in this form.

8 cakes  $\div 2 = 4$  cakes  
 9 apples  $\div 3 = 3$  apples  
 4 cents  $\div 2 = 2$  cents  
 12 dollars  $\div 4 = 3$  dollars  
 Lead to the conclusion that:  
 4 tens  $\div 2 = 2$  tens  
 18 tens  $\div 9 = 2$  tens  
 And so on.

## Teaching the Lesson

Use concrete materials to demonstrate the lesson example.



8 groups of ten  $\rightarrow$  8 tens  $\rightarrow$  80

4 groups of 20

$80 \div 4 = 20$



Translate this into the division algorithm.

$$\begin{array}{r} 2 \text{ tens} \\ 4 \overline{) 8 \text{ tens}} \\ \underline{-8 \text{ tens}} \\ 0 \end{array} \qquad \begin{array}{r} 20 \\ 4 \overline{) 80} \\ \underline{-80} \\ 0 \end{array}$$

Demonstrate other examples at the chalkboard to show how to divide multiples of ten. Write:

$$\begin{array}{r} 4 \\ 7 \overline{) 28} \\ \underline{-28} \\ 0 \end{array}$$

Then write in the zeros.

$$\begin{array}{r} 40 \\ 7 \overline{) 280} \\ \underline{-280} \\ 0 \end{array} \quad \begin{array}{l} 28 \text{ tens divided} \\ \text{by 7 is 4 tens.} \end{array}$$

Emphasize the alignment of digits. Use vertical lines in the chalkboard examples.

$$\begin{array}{r|l} \text{tens} & \text{ones} \\ 6 \overline{) 24} & 0 \end{array}$$

Be sure to have the pupils check their answers by multiplication. Such a procedure often satisfies the doubtful child and makes retention of the rule more certain.

## Dividing Multiples of Ten

The bakery sells strawberry shortcakes for \$4 each. Friday they sold \$80 worth of shortcakes. How many shortcakes did they sell?



Divide. Remember that 80 is 8 tens.

$$8 \div 4 = 2$$

$$8 \text{ tens} \div 4 = 2 \text{ tens}$$

$$\begin{array}{r} 2 \\ 4 \overline{) 8} \\ \underline{-8} \\ 0 \end{array}$$

$$\begin{array}{r} 20 \\ 4 \overline{) 80} \\ \underline{-80} \\ 0 \end{array}$$

The bakery sold 20 shortcakes.

Use the same method for larger numbers.

$$\begin{array}{r} 4 \\ 6 \overline{) 24} \\ \underline{-24} \\ 0 \end{array}$$

$$\begin{array}{r} 40 \\ 6 \overline{) 240} \\ \underline{-240} \\ 0 \end{array}$$

## EXERCISES

Divide

- |   |   |   |   |   |
|---|---|---|---|---|
| 1. $\begin{array}{r} 2 \\ 3 \overline{) 6} \end{array}$     | 2. $\begin{array}{r} 20 \\ 3 \overline{) 60} \end{array}$   | 3. $\begin{array}{r} 4 \\ 2 \overline{) 8} \end{array}$     | 4. $\begin{array}{r} 40 \\ 2 \overline{) 80} \end{array}$   | 5. $\begin{array}{r} 1 \\ 5 \overline{) 5} \end{array}$     |
| 6. $\begin{array}{r} 10 \\ 5 \overline{) 50} \end{array}$   | 7. $\begin{array}{r} 4 \\ 4 \overline{) 16} \end{array}$    | 8. $\begin{array}{r} 40 \\ 4 \overline{) 160} \end{array}$  | 9. $\begin{array}{r} 6 \\ 6 \overline{) 36} \end{array}$    | 10. $\begin{array}{r} 60 \\ 6 \overline{) 360} \end{array}$ |
| 11. $\begin{array}{r} 3 \\ 7 \overline{) 21} \end{array}$   | 12. $\begin{array}{r} 30 \\ 7 \overline{) 210} \end{array}$ | 13. $\begin{array}{r} 9 \\ 3 \overline{) 27} \end{array}$   | 14. $\begin{array}{r} 90 \\ 3 \overline{) 270} \end{array}$ | 15. $\begin{array}{r} 4 \\ 8 \overline{) 32} \end{array}$   |
| 16. $\begin{array}{r} 40 \\ 8 \overline{) 320} \end{array}$ | 17. $\begin{array}{r} 5 \\ 5 \overline{) 25} \end{array}$   | 18. $\begin{array}{r} 50 \\ 5 \overline{) 250} \end{array}$ | 19. $\begin{array}{r} 9 \\ 7 \overline{) 63} \end{array}$   | 20. $\begin{array}{r} 90 \\ 7 \overline{) 630} \end{array}$ |

## Using the Exercises

- The exercises are paired in the following manner.

Basic Fact  $\longrightarrow$  Multiple of Ten

Check for proper alignment of digits and make sure students are recording the complete algorithm, not just the quotients.

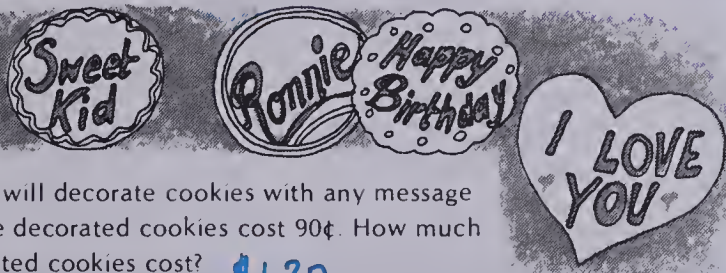
## PRACTICE

Divide $\frac{20}{1 \overline{)20}}$	$\frac{20}{2 \overline{)40}}$	$\frac{20}{3 \overline{)60}}$	$\frac{20}{4 \overline{)80}}$	$\frac{10}{5 \overline{)50}}$
1. $\frac{30}{5 \overline{)150}}$	$\frac{40}{6 \overline{)240}}$	$\frac{50}{7 \overline{)350}}$	$\frac{40}{8 \overline{)320}}$	$\frac{30}{9 \overline{)270}}$
11. $\frac{80}{3 \overline{)240}}$	$\frac{10}{7 \overline{)70}}$	$\frac{90}{8 \overline{)720}}$	$\frac{40}{2 \overline{)80}}$	$\frac{70}{9 \overline{)630}}$
$\frac{10}{1 \overline{)10}}$	$\frac{30}{2 \overline{)60}}$	$\frac{30}{3 \overline{)90}}$	$\frac{10}{4 \overline{)40}}$	$\frac{10}{6 \overline{)60}}$
21. $\frac{60}{5 \overline{)300}}$	$\frac{60}{6 \overline{)360}}$	$\frac{60}{7 \overline{)420}}$	$\frac{80}{8 \overline{)640}}$	$\frac{90}{9 \overline{)810}}$
$\frac{10}{2 \overline{)20}}$	$\frac{90}{6 \overline{)540}}$	$\frac{50}{8 \overline{)400}}$	$\frac{50}{3 \overline{)150}}$	$\frac{50}{9 \overline{)450}}$
26. $\frac{10}{2 \overline{)20}}$	$\frac{90}{6 \overline{)540}}$	$\frac{50}{8 \overline{)400}}$	$\frac{50}{3 \overline{)150}}$	$\frac{50}{9 \overline{)450}}$

Solve.

31. A bakery sold bags of Halloween treats for \$4 each. They sold \$280 worth of these bags. How many bags did they sell? **70**
32. Landy's Bakery pays Betty \$3 an hour for working in the shop. Last week she earned \$60. How many hours did she work? **20h**
33. Oatmeal cookies are packed in boxes. Nine boxes are used to pack 450 cookies. How many cookies are there in each box? **50**

## Get the Message?



Sweet's Bakery will decorate cookies with any message you wish. Three decorated cookies cost 90¢. How much would 4 decorated cookies cost? **\$1.20**

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## Assigning the Practice

Minimum: 1-15, 31

Average: 16-32

Enriched: 16-33

## Reinforcement

1. If students have difficulties, use grid paper to help them align digits.
2. Play a game with a set of cards numbered 200, 210, 240, 270, 280, 300, 320, 350, 360, 400, 420, 450, 480, 490, 540, 560, 630, 640, 720, and 810. Each player draws a card and states a one-digit number that will divide the number on the card evenly.
3. As before, practise multiples of 2 first, then 5, before moving into more difficult tables.

$$2 \overline{)24} \quad 2 \overline{)240} \quad 2 \overline{)18} \quad 2 \overline{)180}$$

## Enrichment

1. Students should be encouraged to extend the division rule to include multiples of 100, and perhaps even 1000. Use of the rule for multiples of 100 will be made in Unit 11.
2. Play the game in Reinforcement 2 using larger numbers, 2800, 3000, 8100, etc.
3. Assign *Get the Message?* on page 195. This is a two-step problem. If students attempt to multiply  $4 \times 90$ , point out that 90¢ is the cost of 3 cookies.  $4 \times 90$ ¢ would be the cost of 12, not 4, cookies. Ask how much one cookie would cost.

## Extra Practice

Divide $\frac{10}{2 \overline{)20}}$	$\frac{30}{3 \overline{)90}}$	$\frac{20}{4 \overline{)80}}$	$\frac{10}{5 \overline{)50}}$
5. $\frac{40}{4 \overline{)160}}$	$\frac{60}{5 \overline{)300}}$	$\frac{80}{6 \overline{)480}}$	$\frac{80}{7 \overline{)560}}$
9. $\frac{20}{3 \overline{)60}}$	$\frac{40}{8 \overline{)320}}$	$\frac{10}{6 \overline{)60}}$	$\frac{70}{9 \overline{)630}}$
13. $\frac{80}{8 \overline{)640}}$	$\frac{80}{9 \overline{)720}}$	$\frac{50}{9 \overline{)450}}$	$\frac{60}{6 \overline{)360}}$

## Worksheet A48

Pages 194-195



# UNIT 9 LESSON 4

## Objective A49

Divide a two-digit dividend by a one-digit divisor where each digit of the dividend is a multiple of the divisor (no remainder).

## Introducing the Lesson

Use concrete materials to work through the lesson example and show the pupils what is happening.

Arrange the counters in 3 equal groups.


 $69 \div 3 = 23$

Do other examples before showing the formal write-up. Use chocolate chips, peanut butter chips, cinnamon hearts, etc. Each set of 10 can be put in a tiny paper cup.

## Teaching the Lesson

Use materials to work through the process in the steps shown on the text page.

"6 tens. Divide tens." 2

"9 ones. Divide ones." 3

Work through the example shown in the display and others like it. At the chalkboard, write basic fact questions. Then attach an extra digit and complete the ones column.

$$\begin{array}{r}
 4 \\
 2 \overline{) 8} \\
 \underline{-8} \\
 0
 \end{array}
 \rightarrow
 \begin{array}{r}
 4 \\
 2 \overline{) 82} \\
 \underline{-8} \\
 0
 \end{array}
 \rightarrow
 \begin{array}{r}
 4 \\
 2 \overline{) 82} \\
 \underline{-8} \\
 02
 \end{array}
 \rightarrow
 \begin{array}{r}
 41 \\
 2 \overline{) 82} \\
 \underline{-8} \\
 02 \\
 \underline{-2} \\
 0
 \end{array}$$

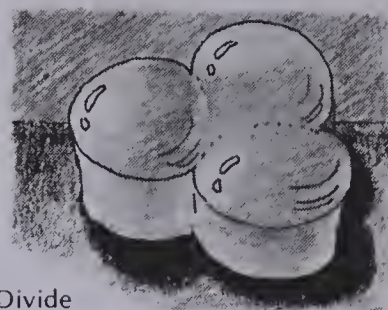
Emphasize the alignment of digits at the chalkboard.

$$\begin{array}{c|c}
 \text{tens} & \text{ones} \\
 \hline
 2 \overline{) 8} & 2
 \end{array}$$

If necessary, students may use grid paper to help them align digits. The routine should be explained as two applications of the EMS (Estimate, Multiply, Subtract) cycle that was used in the preceding lessons. The reason for bringing down the second digit (in the display) should be interpreted as a way of avoiding confusion. Be sure to have the pupils check their answers using the established checking routine.

## Two-Stage Division

Tina is making clover-leaf rolls at the bakery. She puts 3 balls of dough together to make each clover-leaf roll. There are 69 balls of dough. How many rolls can she make?



Write the question.

Divide the tens.

Remember the ones.

Divide the ones.

$$\begin{array}{c}
 3 \overline{) 69} \\
 \hline
 \end{array}
 \rightarrow
 \begin{array}{r}
 2 \\
 3 \overline{) 69} \\
 \underline{-6} \\
 0
 \end{array}
 \rightarrow
 \begin{array}{r}
 2 \\
 3 \overline{) 69} \\
 \underline{-6} \\
 09
 \end{array}
 \rightarrow
 \begin{array}{r}
 23 \\
 3 \overline{) 69} \\
 \underline{-6} \\
 09 \\
 \underline{-9} \\
 0
 \end{array}$$

Tina can make 23 rolls.

To check your answer, multiply.

$$23 \times 3 = 69$$

## EXERCISES

Copy and complete each division.

$$\begin{array}{r}
 2 \\
 1 \overline{) 24} \\
 \underline{-2} \\
 04
 \end{array}$$

$$\begin{array}{r}
 2 \\
 3 \overline{) 63} \\
 \underline{-6} \\
 03
 \end{array}$$

$$\begin{array}{r}
 2 \\
 4 \overline{) 48} \\
 \underline{-4} \\
 08
 \end{array}$$

$$\begin{array}{r}
 1 \\
 5 \overline{) 55} \\
 \underline{-5} \\
 05
 \end{array}$$

$$\begin{array}{r}
 3 \\
 2 \overline{) 66} \\
 \underline{-6} \\
 06
 \end{array}$$

$$\begin{array}{r}
 4 \\
 2 \overline{) 48} \\
 \underline{-2} \\
 08
 \end{array}$$

$$\begin{array}{r}
 1 \\
 4 \overline{) 84} \\
 \underline{-4} \\
 04
 \end{array}$$

$$\begin{array}{r}
 1 \\
 6 \overline{) 66} \\
 \underline{-6} \\
 06
 \end{array}$$

$$\begin{array}{r}
 3 \\
 2 \overline{) 86} \\
 \underline{-4} \\
 06
 \end{array}$$

$$\begin{array}{r}
 1 \\
 3 \overline{) 93} \\
 \underline{-3} \\
 03
 \end{array}$$

Divide. Check your answer.

$$\begin{array}{r}
 23 \\
 2 \overline{) 46}
 \end{array}$$

$$\begin{array}{r}
 13 \\
 3 \overline{) 39}
 \end{array}$$

$$\begin{array}{r}
 22 \\
 4 \overline{) 88}
 \end{array}$$

$$\begin{array}{r}
 10 \\
 7 \overline{) 70}
 \end{array}$$

$$\begin{array}{r}
 11 \\
 9 \overline{) 99}
 \end{array}$$

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## Using the Exercises

- Students work from partially completed division to examples that they must complete on their own.

## PRACTICE

Divide.

1.  $2 \overline{)24}$   $\frac{12}{}$
2.  $3 \overline{)36}$   $\frac{12}{}$
3.  $4 \overline{)48}$   $\frac{12}{}$
4.  $5 \overline{)55}$   $\frac{11}{}$
5.  $6 \overline{)66}$   $\frac{11}{}$
6.  $2 \overline{)48}$   $\frac{24}{}$
7.  $3 \overline{)69}$   $\frac{23}{}$
8.  $4 \overline{)84}$   $\frac{21}{}$
9.  $7 \overline{)70}$   $\frac{10}{}$
10.  $8 \overline{)88}$   $\frac{11}{}$
11.  $2 \overline{)62}$   $\frac{31}{}$
12.  $3 \overline{)93}$   $\frac{31}{}$
13.  $6 \overline{)60}$   $\frac{10}{}$
14.  $2 \overline{)86}$   $\frac{43}{}$
15.  $9 \overline{)99}$   $\frac{11}{}$

Divide. Check your answer.

16.  $3 \overline{)63}$   $\frac{21}{}$
17.  $2 \overline{)22}$   $\frac{11}{}$
18.  $3 \overline{)39}$   $\frac{13}{}$
19.  $4 \overline{)44}$   $\frac{11}{}$
20.  $5 \overline{)50}$   $\frac{10}{}$
21.  $2 \overline{)46}$   $\frac{23}{}$
22.  $1 \overline{)21}$   $\frac{21}{}$
23.  $4 \overline{)88}$   $\frac{22}{}$
24.  $6 \overline{)60}$   $\frac{10}{}$
25.  $7 \overline{)77}$   $\frac{11}{}$
26.  $3 \overline{)99}$   $\frac{33}{}$
27.  $8 \overline{)80}$   $\frac{10}{}$
28.  $1 \overline{)33}$   $\frac{33}{}$
29.  $4 \overline{)40}$   $\frac{10}{}$
30.  $2 \overline{)82}$   $\frac{41}{}$

Solve.

31. The bakery can make 3 pies with the cherries from one container. They made 63 pies. How many containers of cherries did they use?  $\frac{21}{}$

## REVIEW

Divide.

- |     |                                      |                                       |                                       |                                       |                                       |
|-----|--------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
| A46 | 1. $3 \overline{)18}$ $\frac{6}{}$   | 2. $5 \overline{)35}$ $\frac{7}{}$    | 3. $7 \overline{)56}$ $\frac{8}{}$    | 4. $4 \overline{)28}$ $\frac{7}{}$    | 5. $9 \overline{)72}$ $\frac{8}{}$    |
| A47 | 6. $5 \overline{)11}$ $\frac{2R1}{}$ | 7. $6 \overline{)27}$ $\frac{4R3}{}$  | 8. $7 \overline{)38}$ $\frac{5R3}{}$  | 9. $8 \overline{)49}$ $\frac{6R1}{}$  | 10. $9 \overline{)58}$ $\frac{6R4}{}$ |
| A48 | 11. $4 \overline{)80}$ $\frac{20}{}$ | 12. $3 \overline{)120}$ $\frac{40}{}$ | 13. $5 \overline{)250}$ $\frac{50}{}$ | 14. $6 \overline{)420}$ $\frac{70}{}$ | 15. $9 \overline{)450}$ $\frac{50}{}$ |
| A49 | 16. $3 \overline{)69}$ $\frac{23}{}$ | 17. $4 \overline{)44}$ $\frac{11}{}$  | 18. $2 \overline{)82}$ $\frac{41}{}$  | 19. $5 \overline{)55}$ $\frac{11}{}$  | 20. $3 \overline{)93}$ $\frac{31}{}$  |

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## Assigning the Practice

Minimum: 1-10, 16-20

Average: 6-31

Enriched: 16-31

## Review Exercises

Questions	Objective	Pages
1-5	A46	190-191
6-10	A47	192-193
11-15	A48	194-195
16-20	A49	196-197

## Reinforcement

1. Those who are having difficulty keeping work aligned should practise using graph paper.

2. Allow weaker students to move slowly. Have them deal with questions using only one table at a time until ready to move on.

$$2 \overline{)26} \quad 2 \overline{)48} \quad 2 \overline{)28} \quad 2 \overline{)24} \quad 2 \overline{)64}$$

Then try:

$$3 \overline{)36} \quad 3 \overline{)66} \quad \text{and so on.}$$

## Enrichment

1. Make up a game using cards.  
2 players  
20 cards labelled

$$\boxed{3 \overline{)36}} \quad \boxed{2 \overline{)24}} \quad \boxed{4 \overline{)48}} \quad \text{etc.}$$

Place the cards in a pile face down. Players alternate turning up the top card. The first to give the answer keeps the card. They go through the pile. The player with the most cards is the winner.

2. Introduce **short division**. Students may do questions without the "bringing down".

$$\begin{array}{r} 4 \\ 2 \overline{)82} \end{array} \longrightarrow \begin{array}{r} 41 \\ 2 \overline{)82} \end{array}$$

The multiplying and subtracting are done mentally.

## Extra Practice

## Worksheet A49

Pages 196-197

Divide.

1.  $1 \overline{)11}$   $\frac{11}{}$
2.  $2 \overline{)24}$   $\frac{12}{}$
3.  $3 \overline{)39}$   $\frac{13}{}$
4.  $4 \overline{)44}$   $\frac{11}{}$
5.  $2 \overline{)46}$   $\frac{23}{}$
6.  $3 \overline{)63}$   $\frac{21}{}$
7.  $4 \overline{)84}$   $\frac{21}{}$
8.  $5 \overline{)50}$   $\frac{10}{}$
9.  $8 \overline{)88}$   $\frac{11}{}$
10.  $4 \overline{)48}$   $\frac{12}{}$
11.  $3 \overline{)96}$   $\frac{32}{}$
12.  $2 \overline{)84}$   $\frac{42}{}$
13.  $9 \overline{)99}$   $\frac{11}{}$
14.  $7 \overline{)77}$   $\frac{11}{}$
15.  $5 \overline{)55}$   $\frac{11}{}$
16.  $3 \overline{)66}$   $\frac{22}{}$

# UNIT 9 LESSON 5

## Objective A50

Divide a two-digit dividend by a one-digit divisor where the first digit of the dividend is not a multiple of the divisor (no remainder).

## Introducing the Lesson

Review Objective A49. Do an example at the chalkboard.

Tell the students that today we are going to learn what happens when there is a remainder after the first step of the division.

## Teaching the Lesson

Write the following example on the chalkboard.

$$2 \overline{)56}$$



Solve the division using base ten blocks to demonstrate the steps in the algorithm.

2 groups of 2 tens, 1 ten left over.



**Estimate.**      **Multiply.**      **Subtract.**

$\begin{array}{r} 2 \\ 2 \overline{)56} \\ \underline{4} \phantom{0} \\ 16 \end{array}$ <p>5 tens <math>\div</math> 2</p>	$\begin{array}{r} 2 \\ 2 \overline{)56} \\ \underline{4} \phantom{0} \\ 16 \end{array}$ <p>2 tens <math>\times</math> 2 = 4 tens</p>	$\begin{array}{r} 2 \\ 2 \overline{)56} \\ \underline{4} \phantom{0} \\ 16 \end{array}$ <p>5 tens - 4 tens = 1 ten</p>
---	--	--

One ten and six ones are still left to divide by 2.



$$\begin{array}{r} 2 \\ 2 \overline{)56} \\ \underline{4} \phantom{0} \\ 16 \end{array}$$

Divide: 16 ones  $\div$  2

$$\begin{array}{r} 28 \\ 2 \overline{)56} \\ \underline{4} \phantom{0} \\ 16 \end{array}$$



**Estimate.**      **Multiply.**      **Subtract.**

$\begin{array}{r} 28 \\ 2 \overline{)56} \\ \underline{4} \phantom{0} \\ 16 \end{array}$	$\begin{array}{r} 28 \\ 2 \overline{)56} \\ \underline{4} \phantom{0} \\ 16 \end{array}$	$\begin{array}{r} 28 \\ 2 \overline{)56} \\ \underline{4} \phantom{0} \\ 16 \end{array}$
--	--	--

Work through the textbook example.

## Two-Stage Division

Gary is decorating cakes at the bakery. He uses 8 candy roses on each cake. There are 96 candy roses. How many cakes can he decorate?



Write the question.      Divide the tens.      Remember the ones.      Divide.

$8 \overline{)96}$	$\begin{array}{r} 1 \\ 8 \overline{)96} \\ \underline{-8} \phantom{0} \\ 16 \end{array}$	$\begin{array}{r} 1 \\ 8 \overline{)96} \\ \underline{-8} \phantom{0} \\ 16 \end{array}$	$\begin{array}{r} 12 \\ 8 \overline{)96} \\ \underline{-8} \phantom{0} \\ 16 \\ \underline{-16} \\ 0 \end{array}$
--------------------	--	--	---

Gary can decorate 12 cakes.

Check your answer.

$$12 \times 8 = 96$$

## EXERCISES

Copy and complete each division.

1. $\begin{array}{r} 1 \blacksquare 6 \\ 2 \overline{)32} \\ \underline{-2} \phantom{0} \\ 12 \end{array}$	2. $\begin{array}{r} 1 \blacksquare 5 \\ 3 \overline{)45} \\ \underline{-3} \phantom{0} \\ 15 \end{array}$	3. $\begin{array}{r} 1 \blacksquare 6 \\ 4 \overline{)64} \\ \underline{-4} \phantom{0} \\ 24 \end{array}$	4. $\begin{array}{r} 2 \blacksquare 7 \\ 2 \overline{)54} \\ \underline{-4} \phantom{0} \\ 14 \end{array}$	5. $\begin{array}{r} 1 \blacksquare 7 \\ 3 \overline{)51} \\ \underline{-3} \phantom{0} \\ 21 \end{array}$
6. $\begin{array}{r} 2 \blacksquare 4 \\ 3 \overline{)72} \\ \underline{-2} \phantom{0} \\ 12 \end{array}$	7. $\begin{array}{r} 1 \blacksquare 8 \\ 4 \overline{)72} \\ \underline{-3} \phantom{0} \\ 15 \end{array}$	8. $\begin{array}{r} 3 \blacksquare 8 \\ 2 \overline{)76} \\ \underline{-4} \phantom{0} \\ 24 \end{array}$	9. $\begin{array}{r} 2 \blacksquare 8 \\ 3 \overline{)84} \\ \underline{-6} \phantom{0} \\ 24 \end{array}$	10. $\begin{array}{r} 1 \blacksquare 3 \\ 5 \overline{)65} \\ \underline{-5} \phantom{0} \\ 15 \end{array}$

Divide. Check your answer.

11. $\begin{array}{r} 1 \blacksquare 3 \\ 4 \overline{)52} \\ \underline{-4} \phantom{0} \\ 12 \end{array}$	12. $\begin{array}{r} 1 \blacksquare 4 \\ 6 \overline{)84} \\ \underline{-6} \phantom{0} \\ 24 \end{array}$	13. $\begin{array}{r} 11 \blacksquare 4 \\ 7 \overline{)81} \\ \underline{-7} \phantom{0} \\ 11 \end{array}$	14. $\begin{array}{r} 2 \blacksquare 5 \\ 3 \overline{)75} \\ \underline{-6} \phantom{0} \\ 15 \end{array}$	15. $\begin{array}{r} 1 \blacksquare 2 \\ 8 \overline{)96} \\ \underline{-8} \phantom{0} \\ 16 \end{array}$
16. $\begin{array}{r} 4 \blacksquare 6 \\ 2 \overline{)92} \\ \underline{-8} \phantom{0} \\ 12 \end{array}$	17. $\begin{array}{r} 1 \blacksquare 8 \\ 5 \overline{)90} \\ \underline{-5} \phantom{0} \\ 18 \end{array}$	18. $\begin{array}{r} 1 \blacksquare 6 \\ 6 \overline{)96} \\ \underline{-6} \phantom{0} \\ 18 \end{array}$	19. $\begin{array}{r} 2 \blacksquare 3 \\ 4 \overline{)92} \\ \underline{-8} \phantom{0} \\ 12 \end{array}$	20. $\begin{array}{r} 1 \blacksquare 7 \\ 5 \overline{)85} \\ \underline{-5} \phantom{0} \\ 18 \end{array}$

## Using the Exercises

- As previously, the exercises start with partially worked examples. Remind students to check their answers by multiplying the quotient by the divisor and then comparing the answer with the original dividend.



## PRACTICE

Divide.

1.  $2 \overline{)32}^{16}$
2.  $3 \overline{)45}^{15}$
3.  $4 \overline{)52}^{13}$
4.  $5 \overline{)65}^{13}$
5.  $6 \overline{)72}^{12}$
6.  $2 \overline{)54}^{27}$
7.  $3 \overline{)51}^{17}$
8.  $4 \overline{)64}^{16}$
9.  $5 \overline{)70}^{14}$
10.  $6 \overline{)84}^{14}$
11.  $2 \overline{)72}^{36}$
12.  $3 \overline{)75}^{25}$
13.  $4 \overline{)72}^{18}$
14.  $3 \overline{)84}^{28}$
15.  $2 \overline{)92}^{46}$

Divide. Check your answer.

16.  $2 \overline{)36}^{18}$
17.  $3 \overline{)48}^{16}$
18.  $4 \overline{)56}^{14}$
19.  $5 \overline{)60}^{12}$
20.  $6 \overline{)78}^{13}$
21.  $2 \overline{)58}^{29}$
22.  $3 \overline{)57}^{19}$
23.  $4 \overline{)68}^{17}$
24.  $5 \overline{)75}^{15}$
25.  $6 \overline{)96}^{16}$
26.  $2 \overline{)76}^{38}$
27.  $3 \overline{)78}^{26}$
28.  $4 \overline{)76}^{19}$
29.  $3 \overline{)87}^{29}$
30.  $2 \overline{)98}^{49}$

Write a division fact for each multiplication fact.

31.  $17 \times 2 = 34$   
 $34 \div 2 = 17$
32.  $19 \times 5 = 95$   
 $95 \div 5 = 19$
33.  $12 \times 8 = 96$   
 $96 \div 8 = 12$
34.  $26 \times 2 = 52$   
 $52 \div 2 = 26$
35.  $28 \times 3 = 84$   
 $84 \div 3 = 28$
36.  $47 \times 2 = 94$   
 $94 \div 2 = 47$

Solve.

37. Eight children each bought a cookie with a Happy Face on it. In all they paid 96¢. How much did each cookie cost?  $12¢$
38. Landy's Bakery sold \$85 worth of chocolate fudge cakes. Each cake cost \$5. How many cakes were sold?  $17$

## Just Among Friends

If you divide 96 quarters among 4 friends, how many dollars will each friend get?

$\$6$



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## Assigning the Practice

Minimum: 1-10, 16-20, 37

Average: 6-37

Enriched: 16-38

## Reinforcement

1. Play a game with a set of cards with the numbers 42, 44, 50, 51, 52, 54, 55, 56, 57, 63, 64, 65, 68, 69, 76, 78, and 81. Players draw a card and tell whether the number can be divided evenly by 3, 4, or 5. For weaker students, work with just one divisor at a time (3, 4, or 5).

2. Add cards with the numbers 40, 45, 48, 60, 72, 75, and 80 to the set in the game above. Players get double points for knowing that a number is divisible by more than one number.

3. Make calculators available for checking answers to the Practice and Extra Practice.

## Enrichment

1. Assign *Just Among Friends* on page 199. This is a two-step problem involving two successive divisions by 4. If students give 24 as an answer, remind them that each friend *does* get 24 quarters, but the question asks for the number of *dollars*.

2. Extend short division from the previous lesson. Students can use a subscript to keep track of the remainder after the first EMS cycle.

$$\begin{array}{r} 28 \\ 2 \overline{)56} \\ 1 \end{array}$$

## Extra Practice

Divide.

1.  $2 \overline{)34}^{17}$
2.  $3 \overline{)42}^{14}$
3.  $4 \overline{)56}^{14}$
4.  $5 \overline{)60}^{12}$
5.  $2 \overline{)58}^{29}$
6.  $3 \overline{)54}^{18}$
7.  $4 \overline{)68}^{17}$
8.  $7 \overline{)91}^{13}$
9.  $2 \overline{)76}^{38}$
10.  $3 \overline{)78}^{26}$
11.  $4 \overline{)76}^{19}$
12.  $5 \overline{)85}^{17}$
13.  $6 \overline{)96}^{16}$
14.  $8 \overline{)96}^{12}$
15.  $7 \overline{)98}^{14}$
16.  $5 \overline{)65}^{13}$

## Worksheet A50

Pages 198-199

# UNIT 9 LESSON 6

## Objective A51

Divide a two-digit dividend by a one-digit divisor with a two-digit quotient and a remainder.

## Introducing the Lesson

Tell the students that after today's lesson, they will be able to divide *any* two-digit number by a one-digit number. Ask for a few examples to be recorded on the board and attempted later. For example:

$$3\overline{)49}$$

Review remainders and practise a few one-step examples. (See Lesson 2.)

## Teaching the Lesson

The division routine used here is exactly the same as in the previous lesson except that there will be a remainder after the second EMS cycle. Demonstrate the textbook example and a few other examples using concrete materials.

$$6\overline{)80} \quad \text{Estimate. } 8 \text{ tens } \div 6$$

$$\begin{array}{r} 1 \\ 6\overline{)80} \\ -6 \\ \hline 2 \end{array} \quad \begin{array}{l} \text{Multiply and subtract.} \\ 2 \text{ tens left over} \end{array}$$

$$\begin{array}{r} 1 \\ 6\overline{)80} \\ -6 \\ \hline 20 \end{array} \quad \begin{array}{l} \text{2 tens} = 20 \text{ ones} \\ \text{20 ones} \end{array}$$

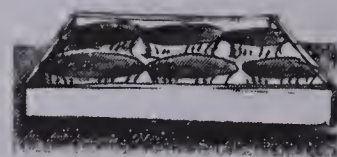
Estimate.  $20 \div 6$

$$\begin{array}{r} 13 \\ 6\overline{)80} \\ -6 \\ \hline 20 \\ -18 \\ \hline 2 \end{array} \quad \begin{array}{l} \text{Multiply and} \\ \text{subtract.} \\ \text{2 left over} \end{array}$$

Remind the students how to check their answers when there is a remainder. Multiply the quotient by the divisor as in the previous lesson. Then, add the remainder and compare with the dividend.

Now have students work the examples previously written on the chalkboard.

## Division with Remainders



The Tart Shop sells butter tarts in trays of 6. They have 80 butter tarts. How many trays of tarts can they make? How many tarts will be left over?

Write the question.	Divide the tens.	Remember the ones.	Divide.	Write the remainder.
$6\overline{)80}$	$\begin{array}{r} 1 \\ 6\overline{)80} \\ -6 \\ \hline 2 \end{array}$	$\begin{array}{r} 1 \\ 6\overline{)80} \\ -6 \\ \hline 20 \end{array}$	$\begin{array}{r} 13 \\ 6\overline{)80} \\ -6 \\ \hline 20 \\ -18 \\ \hline 2 \end{array}$	$\begin{array}{r} 13R2 \\ 6\overline{)80} \\ -6 \\ \hline 20 \\ -18 \\ \hline 2 \end{array}$

They can make 13 trays of tarts. There will be 2 tarts left over.

Check: Multiply the quotient by the divisor.	$\begin{array}{r} 13 \\ \times 6 \\ \hline 78 \end{array}$
Add the remainder.	$\begin{array}{r} 78 \\ + 2 \\ \hline 80 \end{array}$
The dividend is	80

## EXERCISES

Divide. $\begin{array}{r} 21 \\ 1R \\ 2\overline{)25} \\ -2 \\ \hline 05 \end{array}$	$\begin{array}{r} 81 \\ 1R \\ 2\overline{)37} \\ -2 \\ \hline 17 \end{array}$	$\begin{array}{r} 11 \\ 1R \\ 3\overline{)34} \\ -3 \\ \hline 04 \end{array}$	$\begin{array}{r} 52 \\ 1R \\ 3\overline{)47} \\ -3 \\ \hline 17 \end{array}$	$\begin{array}{r} 12 \\ 1R \\ 4\overline{)46} \\ -4 \\ \hline 06 \end{array}$
6. $\begin{array}{r} 43 \\ 1R \\ 4\overline{)59} \\ -4 \\ \hline 19 \end{array}$	7. $\begin{array}{r} 11 \\ 2R \\ 2\overline{)43} \\ -2 \\ \hline 23 \end{array}$	8. $\begin{array}{r} 71 \\ 2R \\ 2\overline{)55} \\ -4 \\ \hline 15 \end{array}$	9. $\begin{array}{r} 82 \\ 1R \\ 3\overline{)56} \\ -3 \\ \hline 26 \end{array}$	10. $\begin{array}{r} 02 \\ 2R \\ 3\overline{)62} \\ -6 \\ \hline 02 \end{array}$
Divide. Check your answer.				
11. $\begin{array}{r} 16R3 \\ 4\overline{)67} \end{array}$	12. $\begin{array}{r} 17R2 \\ 4\overline{)70} \end{array}$	13. $\begin{array}{r} 11R1 \\ 6\overline{)67} \end{array}$	14. $\begin{array}{r} 16R3 \\ 5\overline{)83} \end{array}$	15. $\begin{array}{r} 11R2 \\ 7\overline{)79} \end{array}$

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## Using the Exercises

- The exercises proceed from partially worked examples to questions 11 to 15 which the students must work and check on their own. Be sure all the steps, including checking, are being executed correctly before assigning the Practice.
- Each child should be given ample opportunity to manipulate the base-ten blocks (rods, cubes) while working out division problems. The teacher can provide guidance by illustrating the division using the place value blocks on the overhead projectors.

## PRACTICE

Divide

1.  $2 \overline{)23} \quad 11R1$
2.  $3 \overline{)65} \quad 21R2$
3.  $4 \overline{)87} \quad 21R3$
4.  $5 \overline{)51} \quad 10R1$
5.  $7 \overline{)75} \quad 10R5$
6.  $2 \overline{)37} \quad 18R1$
7.  $3 \overline{)55} \quad 18R1$
8.  $4 \overline{)74} \quad 18R2$
9.  $6 \overline{)86} \quad 14R2$
10.  $9 \overline{)94} \quad 10R4$
11.  $2 \overline{)59} \quad 29R1$
12.  $6 \overline{)67} \quad 11R1$
13.  $3 \overline{)88} \quad 29R1$
14.  $7 \overline{)95} \quad 13R4$
15.  $4 \overline{)65} \quad 16R1$

Divide. Check your answer.

16.  $2 \overline{)49} \quad 24R1$
17.  $3 \overline{)92} \quad 30R2$
18.  $4 \overline{)49} \quad 12R1$
19.  $5 \overline{)58} \quad 11R3$
20.  $7 \overline{)73} \quad 10R3$
21.  $2 \overline{)53} \quad 26R1$
22.  $3 \overline{)47} \quad 15R2$
23.  $4 \overline{)59} \quad 14R3$
24.  $6 \overline{)71} \quad 11R5$
25.  $8 \overline{)90} \quad 11R2$
26.  $3 \overline{)97} \quad 32R1$
27.  $8 \overline{)98} \quad 12R2$
28.  $2 \overline{)65} \quad 32R1$
29.  $7 \overline{)88} \quad 12R4$
30.  $9 \overline{)99} \quad 11$

Solve.

31. The Tart Shop packs lemon tarts in packs of 5. How many packs can be made up from a batch of 68 tarts? How many tarts will be left over? **13 packs, 3 left over**
32. The Tart Shop packed 6 trays of raspberry tarts from a batch of 75 tarts. There were 3 tarts left over. How many tarts were in each tray? **12**

## Jumping to Conclusions

Freddy Frog always jumps 3 m at a time. How many jumps will it take him to reach the end of a 64 m race?

**22**



201

## Extra Practice

Divide

1.  $2 \overline{)27} \quad 13R1$
2.  $3 \overline{)62} \quad 20R2$
3.  $4 \overline{)45} \quad 11R1$
4.  $6 \overline{)69} \quad 11R3$
5.  $3 \overline{)53} \quad 17R2$
6.  $4 \overline{)75} \quad 18R3$
7.  $7 \overline{)84} \quad 12$
8.  $5 \overline{)73} \quad 14R3$
9.  $2 \overline{)83} \quad 41R1$
10.  $8 \overline{)97} \quad 12R1$
11.  $3 \overline{)82} \quad 27R1$
12.  $9 \overline{)98} \quad 10R8$
13.  $6 \overline{)91} \quad 15R1$
14.  $4 \overline{)67} \quad 16R3$
15.  $8 \overline{)71} \quad 8R7$
16.  $5 \overline{)54} \quad 10R4$

## Worksheet A51

Pages 200-201

## Assigning the Practice

Minimum: 1-15

Average: 16-31

Enriched: 16-32

## Reinforcement

1. Play a game using cards numbered from 10 to 99, and a spinner with the numbers from 2 to 9. Deal each player a card. In turn, each player spins and then divides the number on the card by the number obtained on the spinner. If the answer is correct, the player scores one point.

2. Give each student a piece of tag-board approximately 10 cm by 10 cm. Have them write any 2-digit number larger than 50 on the card, the division sign, and 2, 3, or 5. The question will take this form:

$$53 \div 3$$

Have them turn the card over and solve the problem.

$$\begin{array}{r} 17 \text{ R}2 \\ 3 \overline{)53} \\ \underline{-3} \phantom{0} \\ 23 \\ \underline{-21} \\ 2 \end{array}$$

Collect the cards, check them for errors, and place them in an envelope. When the students want to practise, they can take out 3 or 4 cards, do the answers in their math books, and then check the answers.

3. Assign *Jumping to Conclusions* on page 201. Note that  $64 \div 3 = 21 \text{ R}1$  is not the final answer. After 21 jumps, the frog will have leapt 63 m and will not quite have finished the race. 22 jumps will be necessary to complete the race.

## Enrichment

Give students examples to attempt using short division.

$$\begin{array}{r} 16 \text{ R}1 \\ 3 \overline{)49} \\ \underline{18} \\ 1 \end{array}$$



# UNIT 9 LESSON 7

## Objective A52

Divide a three-digit dividend by a one-digit divisor with a two-digit quotient where the first two digits of the dividend are a multiple of the divisor (no remainder).

## Introducing the Lesson

Now that the students can divide any two-digit number by a one-digit number, tell them they can use the same steps to divide larger numbers.

## Teaching the Lesson

Do an example on the board.

$$\begin{array}{r} 2 \overline{)142} \\ \text{Estimate. } 14 \text{ tens} \div 2 = 7 \text{ tens} \end{array}$$

$$\begin{array}{r} 7 \\ 2 \overline{)142} \\ \underline{-14} \phantom{0} \\ 02 \end{array} \quad \text{Multiply and subtract.}$$

Now divide the ones.

$$\begin{array}{r} 7 \\ 2 \overline{)142} \\ \underline{-14} \phantom{0} \\ 02 \end{array} \longrightarrow \begin{array}{r} 71 \\ 2 \overline{)142} \\ \underline{-14} \phantom{0} \\ 02 \\ \underline{-2} \\ 0 \end{array}$$

Use base ten blocks to demonstrate the algorithm as before.

Show 142 as 

Then regroup the hundred block into 10 tens so that there are 14 tens to divide.

Work through the textbook example. Remind students to check their answers by multiplying.

Once again, each child should have the opportunity to manipulate the base ten blocks.

Emphasize correct alignment of digits. Graph paper would be useful here to keep digits aligned properly.

## Three-Digit Dividends

Landy's Bakery sold 123 loaves of bread in 3 days. About how many loaves did they sell each day?

Write the question.

Divide 12 tens by 3.

Remember the ones.

Divide the ones.

$$\begin{array}{r} 3 \overline{)123} \end{array}$$

$$\begin{array}{r} 4 \\ 3 \overline{)123} \\ \underline{-12} \phantom{0} \\ 0 \end{array}$$

$$\begin{array}{r} 4 \\ 3 \overline{)123} \\ \underline{-12} \phantom{0} \\ 03 \end{array}$$

$$\begin{array}{r} 41 \\ 3 \overline{)123} \\ \underline{-12} \phantom{0} \\ 03 \\ \underline{-3} \\ 0 \end{array}$$

They sold about 41 loaves each day.

Check:

$$\begin{array}{r} 41 \\ \times 3 \\ \hline 123 \end{array}$$

## EXERCISES

Copy and complete the division.

- |  |  |  |  |   |
|--|--|--|--|---|
| 1. $\begin{array}{r} 5 \blacksquare 2 \\ 2 \overline{)104} \\ \underline{-10} \\ 04 \end{array}$ | 2. $\begin{array}{r} 5 \blacksquare 3 \\ 3 \overline{)159} \\ \underline{-15} \\ 09 \end{array}$ | 3. $\begin{array}{r} 3 \blacksquare 2 \\ 4 \overline{)128} \\ \underline{-12} \\ 08 \end{array}$ | 4. $\begin{array}{r} 2 \blacksquare 1 \\ 5 \overline{)105} \\ \underline{-10} \\ 05 \end{array}$ | 5. $\begin{array}{r} 3 \blacksquare 1 \\ 6 \overline{)186} \\ \underline{-18} \\ 06 \end{array}$  |
| 6. $\begin{array}{r} 8 \blacksquare 2 \\ 3 \overline{)246} \\ \underline{-24} \\ 06 \end{array}$ | 7. $\begin{array}{r} 5 \blacksquare 2 \\ 4 \overline{)208} \\ \underline{-20} \\ 08 \end{array}$ | 8. $\begin{array}{r} 4 \blacksquare 1 \\ 6 \overline{)246} \\ \underline{-24} \\ 06 \end{array}$ | 9. $\begin{array}{r} 4 \blacksquare 1 \\ 7 \overline{)287} \\ \underline{-28} \\ 07 \end{array}$ | 10. $\begin{array}{r} 3 \blacksquare 1 \\ 8 \overline{)248} \\ \underline{-24} \\ 08 \end{array}$ |

Divide. Check your answer.

- |   |   |   |   |   |
|---|---|---|---|---|
| 11. $\begin{array}{r} 82 \\ 2 \overline{)164} \\ \underline{-16} \\ 04 \end{array}$ | 12. $\begin{array}{r} 51 \\ 5 \overline{)255} \\ \underline{-25} \\ 05 \end{array}$ | 13. $\begin{array}{r} 51 \\ 7 \overline{)357} \\ \underline{-35} \\ 07 \end{array}$ | 14. $\begin{array}{r} 41 \\ 8 \overline{)328} \\ \underline{-32} \\ 08 \end{array}$ | 15. $\begin{array}{r} 41 \\ 9 \overline{)369} \\ \underline{-36} \\ 09 \end{array}$ |
| 16. $\begin{array}{r} 94 \\ 2 \overline{)188} \\ \underline{-18} \\ 08 \end{array}$ | 17. $\begin{array}{r} 71 \\ 3 \overline{)213} \\ \underline{-21} \\ 03 \end{array}$ | 18. $\begin{array}{r} 61 \\ 4 \overline{)244} \\ \underline{-24} \\ 04 \end{array}$ | 19. $\begin{array}{r} 80 \\ 5 \overline{)400} \\ \underline{-40} \\ 00 \end{array}$ | 20. $\begin{array}{r} 70 \\ 6 \overline{)420} \\ \underline{-42} \\ 00 \end{array}$ |

## Using the Exercises

- In all of the questions for this lesson the first cycle involves a basic fact with no remainder. This simplifies the estimation step and allows students to concentrate on mastering the algorithm before going on to more complicated examples.
- The exercises proceed from partially worked examples through to questions 11 to 20 which the students must work on their own.

## PRACTICE

Divide.

- |                                       |                                       |                                       |                                       |                                       |
|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
| 1. $2 \overline{)106}$ <sup>53</sup>  | 2. $3 \overline{)186}$ <sup>62</sup>  | 3. $4 \overline{)168}$ <sup>42</sup>  | 4. $5 \overline{)155}$ <sup>31</sup>  | 5. $6 \overline{)126}$ <sup>21</sup>  |
| 6. $3 \overline{)219}$ <sup>73</sup>  | 7. $5 \overline{)205}$ <sup>41</sup>  | 8. $7 \overline{)287}$ <sup>41</sup>  | 9. $8 \overline{)248}$ <sup>31</sup>  | 10. $9 \overline{)279}$ <sup>31</sup> |
| 11. $4 \overline{)328}$ <sup>82</sup> | 12. $5 \overline{)355}$ <sup>71</sup> | 13. $7 \overline{)357}$ <sup>51</sup> | 14. $8 \overline{)328}$ <sup>41</sup> | 15. $9 \overline{)369}$ <sup>41</sup> |

Divide. Check your answer.

- |                                       |                                       |                                       |                                       |                                       |
|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
| 16. $2 \overline{)184}$ <sup>92</sup> | 17. $3 \overline{)153}$ <sup>51</sup> | 18. $4 \overline{)164}$ <sup>41</sup> | 19. $5 \overline{)105}$ <sup>21</sup> | 20. $6 \overline{)186}$ <sup>31</sup> |
| 21. $3 \overline{)276}$ <sup>92</sup> | 22. $4 \overline{)288}$ <sup>72</sup> | 23. $5 \overline{)255}$ <sup>51</sup> | 24. $6 \overline{)246}$ <sup>41</sup> | 25. $7 \overline{)217}$ <sup>31</sup> |
| 26. $5 \overline{)305}$ <sup>61</sup> | 27. $6 \overline{)366}$ <sup>61</sup> | 28. $7 \overline{)427}$ <sup>61</sup> | 29. $8 \overline{)568}$ <sup>71</sup> | 30. $9 \overline{)639}$ <sup>71</sup> |

Write a division sentence for each multiplication.

- |  |  |  |
|--|--|--|
| 31. $64 \times 2 = 128$<br>$128 \div 2 = 64$ | 32. $52 \times 3 = 156$<br>$156 \div 3 = 52$ | 33. $41 \times 4 = 164$<br>$164 \div 4 = 41$ |
| 34. $41 \times 5 = 205$<br>$205 \div 5 = 41$ | 35. $41 \times 6 = 246$<br>$246 \div 6 = 41$ | 36. $31 \times 8 = 248$<br>$248 \div 8 = 31$ |

Solve.

37. Mr. Lucas makes bread at the bakery. He makes the same number of loaves 6 days a week. Last week he made 306 loaves. How many loaves of bread did he make each day? **51**
38. Christmas cakes from the Specialty Bakery sell for \$8 each. On Tuesday, the cake sales were \$328. How many cakes were sold that day? **41**

## A Pressing Problem

It takes 2 hours to press 21 pairs of pants. 6 friends share the work equally. For how many minutes will each friend press?

**20 minutes**



203

## Assigning the Practice

Minimum: 1-15

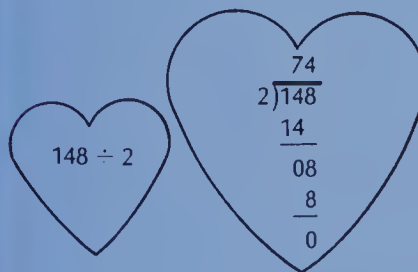
Average: 16-30, 37

Enriched: 21-38

## Reinforcement

- For those having difficulty, have them divide numbers by 2 until they become proficient with the method.
- Make learning packets to set out. On 10 blank cards have students make pumpkin shapes or heart shapes. Also use the back of Valentine cards, Christmas cards, etc. depending on the time of year.

Put a division question on each card. If the other side is blank, have them write out the answer. If the other side is not blank, the students can use a calculator to check their answers. Put division by 2 in one packet, division by 5 in another, and division by 3 in another. This way pupils may choose a packet and take any 5 questions to do.



## Enrichment

1. Assign A Pressing Problem on page 203. This is a two-step problem with extraneous information. The number of pants (21) is irrelevant. Students need to convert 2 hours into minutes and then divide.

2. Use a set of cards with the numbers 105, 124, 126, 147, 148, 155, 156, 168, 186, and 189 and a spinner with the numbers 2 to 9. Lay the cards face up. Each player in turn spins a number and must find a card with a number that is divisible by the number on the spinner. The number of seconds it takes is the player's score. Low score wins.

## Extra Practice

Divide.

- |                                       |                                       |                                       |                                       |
|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
| 1. $2 \overline{)124}$ <sup>62</sup>  | 2. $3 \overline{)156}$ <sup>52</sup>  | 3. $4 \overline{)128}$ <sup>32</sup>  | 4. $3 \overline{)246}$ <sup>82</sup>  |
| 5. $4 \overline{)204}$ <sup>51</sup>  | 6. $6 \overline{)246}$ <sup>41</sup>  | 7. $5 \overline{)355}$ <sup>71</sup>  | 8. $9 \overline{)729}$ <sup>81</sup>  |
| 9. $7 \overline{)497}$ <sup>71</sup>  | 10. $8 \overline{)480}$ <sup>60</sup> | 11. $6 \overline{)366}$ <sup>61</sup> | 12. $2 \overline{)188}$ <sup>94</sup> |
| 13. $6 \overline{)126}$ <sup>21</sup> | 14. $5 \overline{)255}$ <sup>51</sup> | 15. $8 \overline{)408}$ <sup>51</sup> | 16. $9 \overline{)549}$ <sup>61</sup> |

## Worksheet A52

Pages 202-203

# UNIT 9 LESSON 8

## Objective A53

Divide a three-digit dividend by a one-digit divisor with a two-digit quotient where the first two digits of the dividend are not a multiple of the divisor (no remainder).

## Introducing the Lesson

Read the problem at the top of page 204. Ask how it can be solved. Set up the division and point out that we will be able to do the division using the same steps as before.

## Teaching the Lesson

Do the division in the textbook example. Demonstrate it using base ten blocks as outlined in the previous lesson and the introduction to this unit. Try a different example.

$$\begin{array}{r} 7 \\ 3 \overline{)228} \end{array} \quad \text{Estimate.}$$

$$\begin{array}{r} 7 \\ 3 \overline{)228} \\ \underline{-21} \end{array} \quad \text{Multiply. } 7 \times 3 = 21$$

1 Subtract.  $22 - 21 = 1$

$$\begin{array}{r} 76 \\ 3 \overline{)228} \\ \underline{-21} \downarrow \\ 18 \\ \underline{-18} \\ 0 \end{array} \quad \text{Bring down the 8 ones and repeat the EMS cycle.}$$

Demonstrate it on the overhead using base ten blocks. Then have each child illustrate a division by manipulating the base ten blocks. Perhaps they could work in groups of 2 or 3.

## Three-Digit Dividends

Landy's Bakery has 258 kg of bran. They use 6 kg of bran in each batch of muffins. How many batches of muffins can they make with the bran?



Write the question.

Divide 25 tens by 6.

Remember the ones.

Divide the ones.

$$\begin{array}{r} 6 \overline{)258} \\ \underline{-24} \\ 18 \end{array}$$

$$\begin{array}{r} \text{Check: } 43 \\ \times 6 \\ \hline 258 \end{array}$$

They can make 43 batches of muffins.

## EXERCISES

Copy and complete the division.

$$\begin{array}{r} 7 \\ 2 \overline{)114} \\ \underline{-10} \\ 14 \end{array}$$

$$\begin{array}{r} 3 \\ 3 \overline{)108} \\ \underline{-9} \\ 18 \end{array}$$

$$\begin{array}{r} 3 \\ 4 \overline{)136} \\ \underline{-12} \\ 16 \end{array}$$

$$\begin{array}{r} 2 \\ 5 \overline{)115} \\ \underline{-10} \\ 15 \end{array}$$

$$\begin{array}{r} 3 \\ 6 \overline{)198} \\ \underline{-18} \\ 18 \end{array}$$

$$\begin{array}{r} 7 \\ 3 \overline{)201} \\ \underline{-21} \\ 1 \end{array}$$

$$\begin{array}{r} 5 \\ 5 \overline{)275} \\ \underline{-25} \\ 25 \end{array}$$

$$\begin{array}{r} 4 \\ 6 \overline{)264} \\ \underline{-24} \\ 24 \end{array}$$

$$\begin{array}{r} 2 \\ 7 \overline{)294} \\ \underline{-14} \\ 154 \end{array}$$

$$\begin{array}{r} 4 \\ 8 \overline{)272} \\ \underline{-32} \\ 32 \end{array}$$

Divide. Check your answer.

$$\begin{array}{r} 88 \\ 2 \overline{)176} \\ \underline{-176} \\ 0 \end{array}$$

$$\begin{array}{r} 56 \\ 6 \overline{)336} \\ \underline{-336} \\ 0 \end{array}$$

$$\begin{array}{r} 52 \\ 7 \overline{)364} \\ \underline{-364} \\ 0 \end{array}$$

$$\begin{array}{r} 43 \\ 8 \overline{)344} \\ \underline{-344} \\ 0 \end{array}$$

$$\begin{array}{r} 43 \\ 9 \overline{)387} \\ \underline{-387} \\ 0 \end{array}$$

$$\begin{array}{r} 62 \\ 5 \overline{)310} \\ \underline{-310} \\ 0 \end{array}$$

$$\begin{array}{r} 96 \\ 4 \overline{)384} \\ \underline{-384} \\ 0 \end{array}$$

$$\begin{array}{r} 84 \\ 6 \overline{)504} \\ \underline{-504} \\ 0 \end{array}$$

$$\begin{array}{r} 68 \\ 7 \overline{)476} \\ \underline{-476} \\ 0 \end{array}$$

$$\begin{array}{r} 83 \\ 8 \overline{)664} \\ \underline{-664} \\ 0 \end{array}$$

204

## Using the Exercises

- As before, the exercises begin with partially worked examples. Remind students to check their answers by multiplying.



## PRACTICE

Divide

1. $2 \overline{)114}$ <u>74</u>	2. $3 \overline{)105}$ <u>64</u>	3. $4 \overline{)152}$ <u>55</u>	4. $5 \overline{)135}$ <u>44</u>	5. $6 \overline{)168}$ <u>32</u>
6. $3 \overline{)222}$ <u>84</u>	7. $4 \overline{)256}$ <u>65</u>	8. $5 \overline{)275}$ <u>56</u>	9. $6 \overline{)264}$ <u>47</u>	10. $7 \overline{)224}$ <u>42</u>
11. $4 \overline{)336}$	12. $5 \overline{)325}$	13. $6 \overline{)336}$	14. $7 \overline{)329}$	15. $8 \overline{)336}$

Divide. Check your answers.

16. $2 \overline{)194}$ <u>87</u>	17. $3 \overline{)174}$ <u>74</u>	18. $4 \overline{)192}$ <u>53</u>	19. $5 \overline{)180}$ <u>48</u>	20. $6 \overline{)174}$ <u>38</u>
21. $3 \overline{)261}$ <u>77</u>	22. $4 \overline{)296}$ <u>79</u>	23. $5 \overline{)265}$ <u>83</u>	24. $6 \overline{)288}$ <u>84</u>	25. $7 \overline{)266}$ <u>94</u>
26. $5 \overline{)385}$	27. $6 \overline{)474}$	28. $7 \overline{)581}$	29. $8 \overline{)672}$	30. $9 \overline{)846}$

Write a division sentence for each multiplication.

31. $66 \times 2 = 132$ $132 \div 2 = 66$	32. $57 \times 3 = 171$ $171 \div 3 = 57$	33. $36 \times 4 = 144$ $144 \div 4 = 36$
34. $48 \times 5 = 240$ $240 \div 5 = 48$	35. $26 \times 7 = 182$ $182 \div 7 = 26$	36. $24 \times 9 = 216$ $216 \div 9 = 24$

Solve.

37. Landy's Bakery uses 300 mL of baking soda in cookie dough each week. They bake cookies 4 times a week. How much baking soda do they use each time they bake cookies? **75 mL**

## Raisin Trouble

Show what numbers are under the raisins



$$\begin{array}{r} 64 \\ 3 \overline{)192} \\ \underline{-18} \phantom{0} \\ 12 \\ \underline{-12} \\ 0 \end{array}$$

$$\begin{array}{r} 54 \\ 7 \overline{)378} \\ \underline{-35} \phantom{0} \\ 28 \\ \underline{-28} \\ 0 \end{array}$$

205

## Assigning the Practice

Minimum: 1-15

Average: 16-30, 37

Enriched: 21-37

## Reinforcement

1. Play a game with a set of cards with the numbers 245, 252, 256, 259, 264, 266, 270, 272, and 280. Three players are dealt three cards each. Players must find whether the numbers on their cards are divisible by 6, 7, or 8. One point is scored for each correct answer. Two points are scored for numbers divisible by more than one of the numbers.

Variation: Players may time themselves. The fastest time may score extra points.

2. Make up packets as in the previous lesson, making numbers suitable to the lesson. The student chooses a packet and picks any 5 cards to do. Suggest timing work to build up speed. Use a calculator to check work.

## Enrichment

Assign *Raisin Trouble* on page 205. This requires the problem-solving skills of guessing, checking, and working backwards.

## Extra Practice

Divide.

1. $2 \overline{)136}$ <u>68</u>	2. $3 \overline{)114}$ <u>38</u>	3. $4 \overline{)172}$ <u>43</u>	4. $3 \overline{)285}$ <u>95</u>
5. $6 \overline{)276}$ <u>46</u>	6. $8 \overline{)296}$ <u>37</u>	7. $5 \overline{)395}$ <u>79</u>	8. $9 \overline{)684}$ <u>76</u>
9. $7 \overline{)483}$ <u>69</u>	10. $8 \overline{)680}$ <u>85</u>	11. $9 \overline{)891}$ <u>99</u>	12. $6 \overline{)354}$ <u>59</u>
13. $6 \overline{)504}$ <u>84</u>	14. $9 \overline{)576}$ <u>64</u>	15. $5 \overline{)435}$ <u>87</u>	16. $7 \overline{)644}$ <u>92</u>

## Worksheet A53

Pages 204-205

# UNIT 9 LESSON 9

## Objective A54

Divide a three-digit dividend by a one-digit divisor with a two-digit quotient and a remainder.

## Introducing the Lesson

The examples in the previous lesson all divide out evenly. There were no remainders. For example:

$$\begin{array}{r} 88 \\ 3 \overline{) 264} \\ \underline{-24} \phantom{0} \\ 24 \\ \underline{-24} \\ 0 \end{array}$$

This doesn't always happen. Try  $265 \div 3$ .

$$\begin{array}{r} 88 \text{ R}1 \\ 3 \overline{) 265} \\ \underline{-24} \phantom{0} \\ 25 \\ \underline{-24} \\ 1 \end{array}$$

## Teaching the Lesson

This lesson is basically a repeat of the previous lesson. It will provide some necessary practice as well as a review of the write-up for division with remainders. It will be necessary to review the checking procedure for such questions since some students find it confusing.

Observe that the hundreds digit is always smaller than the divisor. This is the clue to treat the first two digits together as a number of tens. Students can now deal with any such example. Later (in Unit 11), we will deal with examples in which the hundreds digit is larger than the divisor.

Emphasize that each digit in the quotient is placed above the last digit used in the dividend.

Example:

$$\begin{array}{r} 78 \text{ R}2 \\ 3 \overline{) 236} \\ \underline{-21} \phantom{0} \\ 26 \\ \underline{-24} \\ 2 \end{array}$$

Note: The 7 is placed above the 3 and the 8 is placed above the 6.

## Remainders

Bon Appétit Restaurant needs 152 pieces of pie for the Garden Club luncheon. A pie can be cut into 6 pieces. How many pies do they need?

Write the question.

Divide 6 into 15 tens.

Remember the ones.

Divide the ones.

Write the remainder.

They need 25 pies, and 2 pieces more.

Check:

$$\begin{array}{r} 25 \text{ quotient} \\ \times 6 \text{ divisor} \\ \hline 150 \\ + 2 \text{ remainder} \\ \hline 152 \text{ dividend} \end{array}$$

## EXERCISES

Copy and complete the division.

- $2 \overline{) 113}$   $5 \text{ R}1$
- $3 \overline{) 107}$   $3 \text{ R}5$
- $4 \overline{) 169}$   $4 \text{ R}1$
- $5 \overline{) 167}$   $3 \text{ R}2$
- $6 \overline{) 189}$   $3 \text{ R}1$
- $2 \overline{) 155}$   $7 \text{ R}1$
- $4 \overline{) 249}$   $6 \text{ R}1$
- $6 \overline{) 275}$   $4 \text{ R}5$
- $7 \overline{) 299}$   $4 \text{ R}2$
- $8 \overline{) 247}$   $3 \text{ R}1$

Divide. Check your answer.

- $3 \overline{) 271}$   $90 \text{ R}1$
- $5 \overline{) 368}$   $73 \text{ R}3$
- $7 \overline{) 397}$   $56 \text{ R}5$
- $8 \overline{) 388}$   $48 \text{ R}4$
- $9 \overline{) 489}$   $54 \text{ R}3$

## Using the Exercises

- The exercises begin with partially worked examples. Remind students to check answers by multiplying the quotient by the divisor and then adding the remainder.

## PRACTICE

Divide.

1.  $2 \overline{)125}$  **62 R1**
2.  $3 \overline{)108}$  **36**
3.  $4 \overline{)167}$  **41 R3**
4.  $5 \overline{)193}$  **38 R3**
5.  $6 \overline{)157}$  **26 R1**
6.  $3 \overline{)257}$  **85 R2**
7.  $4 \overline{)281}$  **70 R1**
8.  $5 \overline{)252}$  **50 R2**
9.  $6 \overline{)278}$  **46 R2**
10.  $7 \overline{)263}$  **37 R4**
11.  $4 \overline{)370}$  **92 R2**
12.  $6 \overline{)485}$  **80 R5**
13.  $7 \overline{)583}$  **83 R2**
14.  $8 \overline{)722}$  **90 R2**
15.  $9 \overline{)807}$  **89 R6**

Divide. Check your answers.

16.  $5 \overline{)398}$  **79 R3**
17.  $6 \overline{)574}$  **95 R4**
18.  $7 \overline{)631}$  **90 R1**
19.  $8 \overline{)769}$  **96 R1**
20.  $9 \overline{)812}$  **90 R2**

Solve.

21. The Cookie Factory packs Coconut Crunchies in packs of 6. How many packs can be made from 260 cookies? How many cookies are left? **43 packs, 2 left**

## Some Remaining Riddles

I am a number between 20 and 35.  
I have a remainder of 1 when divided by 2, 3, or 5. Who am I? **31**



I am a number between 50 and 70.  
I have a remainder of 1 when divided by 3.  
I have a remainder of 4 when divided by 6.  
I have no remainder when divided by 4.  
Who am I? **64**

I am a number between 330 and 360.  
I have a remainder of 1 when divided by 6.  
I have a remainder of 5 when divided by 8.  
Who am I? **349**

207

## Assigning the Practice

Minimum: 1-15

Average: 6-21

Enriched: 11-21

## Reinforcement

1. The student supplies any three-digit number smaller than 600 and divides it by 6, 7, 8, or 9.

$$342 \div 6$$

Students can make up their own questions or make up one and trade with someone. Have them time themselves when they answer.

2. Assign *Some Remaining Riddles* on page 207. Students may solve these by trying all the numbers between the given numbers. The more advanced students may make a list. For example:

Divisor	Numbers with remainder of 1
2	21, 23, 25, 27, 29, <b>31</b> , 33
3	22, 25, 28, <b>31</b> , 34
5	21, 26, <b>31</b>

31 appears in each list and so is the correct answer.

## Enrichment

Supply the missing numbers.

$$\begin{array}{r} \square\square R \square \\ 4 \overline{) \square\square 7} \\ - 36 \\ \hline 17 \\ - 1\square \\ \hline \square \end{array}$$

$$\begin{array}{r} \square\square R 6 \\ \square \overline{) 23\square} \\ - 2\square \\ \hline 2\square \\ - 2\square \\ \hline 6 \end{array}$$

## Extra Practice

Divide.

1.  $2 \overline{)119}$  **59 R1**
2.  $3 \overline{)125}$  **41 R2**
3.  $4 \overline{)170}$  **42 R2**
4.  $4 \overline{)246}$  **61 R2**
5.  $5 \overline{)281}$  **56 R1**
6.  $6 \overline{)227}$  **37 R5**
7.  $7 \overline{)476}$  **68**
8.  $8 \overline{)679}$  **84 R7**
9.  $9 \overline{)723}$  **80 R3**
10.  $7 \overline{)392}$  **56**
11.  $9 \overline{)661}$  **73 R4**
12.  $5 \overline{)459}$  **91 R4**
13.  $6 \overline{)345}$  **57 R3**
14.  $4 \overline{)381}$  **95 R1**
15.  $8 \overline{)583}$  **72 R7**
16.  $7 \overline{)600}$  **85 R5**

## Worksheet A54

Pages 206-207



## UNIT 9 LESSON 10

### Objective PS9

Identify the correct operation in a problem-solving situation.

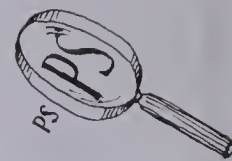
### Introducing the Lesson

Discuss the solution of problems involving addition, subtraction, multiplication, and division. Stress the need for understanding key words that suggest the operation to use. Ask students to make up problems for their classmates. These problems should entail just one of the four operations. Suggest that they be based on the bakery theme. Discuss the key words in these problems.

### Teaching the Lesson

If the students are not familiar with multiple choice tests, discuss the way they should be answered and that it is important not to guess. They should realize that the same care and effort used for solving standard problems is still required.

## Problem Solving Quiz



Name the operation that gives the correct answer.

1. How many lemon tarts are there in a box that contains 2 rows with 6 tarts in each row?

$6 + 2$        $6 - 2$        $6 \times 2$        $6 \div 2$

2. How much do a 30¢ honey donut and 40¢ jelly donut cost together?

$40 + 30$        $40 - 30$        $40 \times 30$        $40 \div 30$

3. A batch of 24 rolls is packed in bags with 6 rolls in each. How many bags of rolls are there?

$24 + 6$        $24 - 6$        $24 \times 6$        $24 \div 6$

4. A big chocolate cake costs \$9.00. A small one costs \$3.00. What is the difference in price?

$9 + 3$        $9 - 3$        $9 \times 3$        $9 \div 3$

5. How many brownies are needed to fill an order for three dozen brownies?

$12 + 3$        $12 - 3$        $12 \times 3$        $12 \div 3$

6. How many cookies are there in an order of 24 chocolate chip and 12 oatmeal cookies?

$24 + 12$        $24 - 12$        $24 \times 12$        $24 \div 12$

7. A bakery uses 48 butter tarts to fill 8 trays. How many tarts are there in each tray?

$48 + 8$        $48 - 8$        $48 \times 8$        $48 \div 8$

8. A 3.2 g piece of candy and a 2.6 g piece were left. How much candy was left?

$3.2 + 2.6$        $3.2 - 2.6$        $3.2 \times 2.6$        $3.2 \div 2.6$

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### Using the Exercises

- Assign the quiz to the pupils. Make sure that they have extra paper and access to suitable concrete materials.
- These exercises can be done with the whole class. Have students show 1 finger for addition, 2 fingers for subtraction, 3 fingers for multiplication, and 4 fingers for division.
- After the quiz has been completed, discuss the *Facts* and *Decide* steps for each problem so that the students can correct each others' papers. When the papers have been returned, survey the results to determine whether or not a comprehensive review of each type of problem is necessary. Do not leave your pupils with a feeling of failure at this point. If necessary, review this material, then give the students an equivalent quiz. At this point, they must have confidence in their problem-solving skills.

## PRACTICE

Solve.

- Natalie bought a dozen coconut cookies for \$1.80 and a dozen date cookies for \$1.20. How much did she pay for all the cookies? **\$3.00**
- Leon bought a tray of strawberry tarts for supper. The tray had 4 rows of 6 tarts. How many tarts did he get? **24**
- Best Bakery packs hamburger buns in plastic bags. There are 8 buns in a bag. How many bags are needed for a batch of 80 buns? **10**
- Joanne wanted to buy a pie. The blueberry pie cost \$2.50 and the banana cream pie cost \$3.20. What was the difference in price? **\$0.70**
- Dante's father bought 3 bags of hot dog buns for their family picnic. There were 8 buns in each bag. How many buns did his father buy altogether? **24**

## REVIEW

Divide.

- |     |                                      |                                      |                                      |                                      |                                      |
|-----|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| A50 | 1. $2 \overline{)52}$ <b>26</b>      | 2. $3 \overline{)45}$ <b>15</b>      | 3. $4 \overline{)68}$ <b>17</b>      | 4. $5 \overline{)60}$ <b>12</b>      | 5. $6 \overline{)84}$ <b>14</b>      |
| A51 | 6. $4 \overline{)97}$ <b>24 R1</b>   | 7. $3 \overline{)40}$ <b>13 R1</b>   | 8. $2 \overline{)55}$ <b>27 R1</b>   | 9. $7 \overline{)81}$ <b>11 R4</b>   | 10. $6 \overline{)81}$ <b>13 R3</b>  |
| A52 | 11. $2 \overline{)146}$ <b>73</b>    | 12. $3 \overline{)243}$ <b>81</b>    | 13. $4 \overline{)328}$ <b>82</b>    | 14. $6 \overline{)366}$ <b>61</b>    | 15. $9 \overline{)459}$ <b>51</b>    |
| A53 | 16. $3 \overline{)162}$ <b>54</b>    | 17. $2 \overline{)130}$ <b>65</b>    | 18. $4 \overline{)256}$ <b>64</b>    | 19. $7 \overline{)441}$ <b>63</b>    | 20. $8 \overline{)424}$ <b>53</b>    |
| A54 | 21. $4 \overline{)230}$ <b>57 R2</b> | 22. $5 \overline{)411}$ <b>82 R1</b> | 23. $2 \overline{)131}$ <b>65 R1</b> | 24. $3 \overline{)133}$ <b>44 R1</b> | 25. $8 \overline{)420}$ <b>52 R4</b> |

209

## Assigning the Practice

Minimum: 1-5

Average: 1-5

Enriched: 1-5

## Review Exercises

Questions	Objective	Pages
1-5	A50	198-199
6-10	A51	200-201
11-15	A52	202-203
16-20	A53	204-205
21-25	A54	206-207

## Reinforcement

1. Ask the pupils to make up their own problems like the ones in the practice exercises.

2. If conditions permit, arrange a visit to a local bakery and gather actual data on baked goods and sales. Then make up problems using this data.

3. Gather flyers or coloured ads from the local grocery stores that advertise baked goods. Have these available for students to use to make realistic story problems.

## Enrichment

Have a small group visit a large grocery store in your area. Have them visit the bakery section and record the prices of various goods. These then are to be brought back and displayed so others may make use of them in writing problems.

## Extra Practice

## Worksheet PS9

Pages 208-209

Solve

- A strawberry shortcake costs \$5.50. A Boston cream pie costs \$4.20. How much more does the shortcake cost? **\$1.30**
- A loaf of Nature Bread has a mass of 680 g. What is the mass of 4 loaves of Nature Bread? **2720 g**
- A dozen honey donuts cost \$3.20. A dozen chocolate donuts cost \$3.80. How much do they cost together? **\$7.00**
- A loaf of bread has 26 slices. How many double-decker sandwiches can you make from one loaf? **8**

## Problem Solving Activities

Assign Level 4, Unit 8

Unit 9 Objective	Test Questions	Pages
A46	1-10	190-191
A47	11-20	192-193
A48	21-30	194-195
A49	31-35	196-197
A50	36-40	198-199
A51	41-45	200-201
A52	46-50	202-203
A53	51-55	204-205
A54	56-60	206-207
PS	61	

# TEST

# UNIT 9

Divide.

1.  $4 \overline{)24}$   $\frac{6}{}$
2.  $2 \overline{)14}$   $\frac{7}{}$
3.  $3 \overline{)18}$   $\frac{6}{}$
4.  $4 \overline{)28}$   $\frac{7}{}$
5.  $6 \overline{)36}$   $\frac{6}{}$
6.  $4 \overline{)16}$   $\frac{4}{}$
7.  $5 \overline{)25}$   $\frac{5}{}$
8.  $6 \overline{)42}$   $\frac{7}{}$
9.  $7 \overline{)49}$   $\frac{7}{}$
10.  $8 \overline{)72}$   $\frac{9}{}$
11.  $3 \overline{)16}$   $\frac{5R1}{}$
12.  $4 \overline{)18}$   $\frac{4R2}{}$
13.  $5 \overline{)32}$   $\frac{6R2}{}$
14.  $7 \overline{)37}$   $\frac{5R2}{}$
15.  $8 \overline{)43}$   $\frac{5R3}{}$
16.  $5 \overline{)23}$   $\frac{4R3}{}$
17.  $6 \overline{)38}$   $\frac{6R2}{}$
18.  $7 \overline{)45}$   $\frac{6R3}{}$
19.  $8 \overline{)60}$   $\frac{7R4}{}$
20.  $9 \overline{)71}$   $\frac{7R8}{}$
21.  $2 \overline{)80}$   $\frac{40}{}$
22.  $2 \overline{)90}$   $\frac{45}{}$
23.  $4 \overline{)40}$   $\frac{10}{}$
24.  $5 \overline{)50}$   $\frac{10}{}$
25.  $6 \overline{)60}$   $\frac{10}{}$
26.  $4 \overline{)160}$   $\frac{40}{}$
27.  $5 \overline{)350}$   $\frac{70}{}$
28.  $6 \overline{)540}$   $\frac{90}{}$
29.  $7 \overline{)630}$   $\frac{90}{}$
30.  $8 \overline{)400}$   $\frac{50}{}$
31.  $2 \overline{)26}$   $\frac{13}{}$
32.  $3 \overline{)63}$   $\frac{21}{}$
33.  $4 \overline{)48}$   $\frac{12}{}$
34.  $6 \overline{)66}$   $\frac{11}{}$
35.  $7 \overline{)77}$   $\frac{11}{}$
36.  $3 \overline{)48}$   $\frac{16}{}$
37.  $4 \overline{)92}$   $\frac{23}{}$
38.  $5 \overline{)65}$   $\frac{13}{}$
39.  $6 \overline{)84}$   $\frac{14}{}$
40.  $8 \overline{)96}$   $\frac{12}{}$
41.  $5 \overline{)54}$   $\frac{10R4}{}$
42.  $6 \overline{)73}$   $\frac{12R1}{}$
43.  $7 \overline{)79}$   $\frac{11R2}{}$
44.  $8 \overline{)90}$   $\frac{11R2}{}$
45.  $4 \overline{)65}$   $\frac{16R1}{}$
46.  $2 \overline{)168}$   $\frac{84}{}$
47.  $3 \overline{)126}$   $\frac{42}{}$
48.  $4 \overline{)324}$   $\frac{81}{}$
49.  $5 \overline{)405}$   $\frac{81}{}$
50.  $8 \overline{)568}$   $\frac{71}{}$
51.  $3 \overline{)171}$   $\frac{57}{}$
52.  $4 \overline{)272}$   $\frac{68}{}$
53.  $5 \overline{)325}$   $\frac{65}{}$
54.  $7 \overline{)441}$   $\frac{63}{}$
55.  $9 \overline{)783}$   $\frac{87}{}$
56.  $5 \overline{)413}$   $\frac{82R3}{}$
57.  $6 \overline{)502}$   $\frac{83R4}{}$
58.  $7 \overline{)655}$   $\frac{93R4}{}$
59.  $8 \overline{)778}$   $\frac{97R2}{}$
60.  $9 \overline{)869}$   $\frac{96R5}{}$

Solve.

61. The Cookie Shop uses 570 g of raisins in the dough for 6 batches of cookies. How many grams of raisins are in each batch of cookies?  $95g$

210

## Post-test

## Unit 9

1.  $2 \overline{)18}$   $\frac{9}{}$
2.  $6 \overline{)42}$   $\frac{7}{}$
3.  $7 \overline{)63}$   $\frac{9}{}$
4.  $5 \overline{)45}$   $\frac{9}{}$
5.  $4 \overline{)28}$   $\frac{7}{}$
6.  $8 \overline{)68}$   $\frac{8R4}{}$
7.  $9 \overline{)82}$   $\frac{9R1}{}$
8.  $3 \overline{)23}$   $\frac{7R2}{}$
9.  $6 \overline{)34}$   $\frac{5R4}{}$
10.  $5 \overline{)39}$   $\frac{7R4}{}$
11.  $3 \overline{)90}$   $\frac{30}{}$
12.  $6 \overline{)180}$   $\frac{30}{}$
13.  $7 \overline{)420}$   $\frac{60}{}$
14.  $2 \overline{)160}$   $\frac{80}{}$
15.  $5 \overline{)450}$   $\frac{90}{}$
16.  $3 \overline{)96}$   $\frac{32}{}$
17.  $5 \overline{)55}$   $\frac{11}{}$
18.  $4 \overline{)84}$   $\frac{21}{}$
19.  $2 \overline{)64}$   $\frac{32}{}$
20.  $9 \overline{)99}$   $\frac{11}{}$



# MULTIPLICATION

Multiply.

- |  |  |  |  |  |
|--|--|--|--|--|
| 1. $\begin{array}{r} 50 \\ \times 5 \\ \hline 250 \end{array}$ | 2. $\begin{array}{r} 30 \\ \times 6 \\ \hline 180 \end{array}$ | 3. $\begin{array}{r} 60 \\ \times 4 \\ \hline 240 \end{array}$ | 4. $\begin{array}{r} 80 \\ \times 7 \\ \hline 560 \end{array}$ | 5. $\begin{array}{r} 70 \\ \times 9 \\ \hline 630 \end{array}$ |
|--|--|--|--|--|

Find the answer.

- |                             |                             |                             |                                |
|-----------------------------|-----------------------------|-----------------------------|--------------------------------|
| 6. $6 \times (4 + 4)$<br>48 | 7. $7 \times (6 + 2)$<br>56 | 8. $8 \times (5 + 4)$<br>72 | 9. $7 \times (30 + 50)$<br>560 |
|-----------------------------|-----------------------------|-----------------------------|--------------------------------|

Multiply.

- |  |   |   |   |   |
|--|---|---|---|---|
| 10. $\begin{array}{r} 13 \\ \times 3 \\ \hline 39 \end{array}$   | 11. $\begin{array}{r} 21 \\ \times 4 \\ \hline 84 \end{array}$    | 12. $\begin{array}{r} 52 \\ \times 3 \\ \hline 156 \end{array}$   | 13. $\begin{array}{r} 74 \\ \times 2 \\ \hline 148 \end{array}$   | 14. $\begin{array}{r} 83 \\ \times 3 \\ \hline 249 \end{array}$   |
| 15. $\begin{array}{r} 45 \\ \times 2 \\ \hline 90 \end{array}$   | 16. $\begin{array}{r} 27 \\ \times 3 \\ \hline 81 \end{array}$    | 17. $\begin{array}{r} 18 \\ \times 4 \\ \hline 72 \end{array}$    | 18. $\begin{array}{r} 46 \\ \times 6 \\ \hline 276 \end{array}$   | 19. $\begin{array}{r} 74 \\ \times 5 \\ \hline 370 \end{array}$   |
| 20. $\begin{array}{r} 400 \\ \times 2 \\ \hline 800 \end{array}$ | 21. $\begin{array}{r} 300 \\ \times 3 \\ \hline 900 \end{array}$  | 22. $\begin{array}{r} 200 \\ \times 4 \\ \hline 800 \end{array}$  | 23. $\begin{array}{r} 700 \\ \times 5 \\ \hline 3500 \end{array}$ | 24. $\begin{array}{r} 600 \\ \times 9 \\ \hline 5400 \end{array}$ |
| 25. $\begin{array}{r} 420 \\ \times 2 \\ \hline 840 \end{array}$ | 26. $\begin{array}{r} 313 \\ \times 3 \\ \hline 939 \end{array}$  | 27. $\begin{array}{r} 302 \\ \times 4 \\ \hline 1208 \end{array}$ | 28. $\begin{array}{r} 632 \\ \times 3 \\ \hline 1896 \end{array}$ | 29. $\begin{array}{r} 627 \\ \times 3 \\ \hline 1881 \end{array}$ |
| 30. $\begin{array}{r} 134 \\ \times 2 \\ \hline 268 \end{array}$ | 31. $\begin{array}{r} 421 \\ \times 4 \\ \hline 1684 \end{array}$ | 32. $\begin{array}{r} 328 \\ \times 3 \\ \hline 984 \end{array}$  | 33. $\begin{array}{r} 518 \\ \times 5 \\ \hline 2590 \end{array}$ | 34. $\begin{array}{r} 759 \\ \times 6 \\ \hline 4554 \end{array}$ |
| 35. $3 \times 1 \times 3$<br>9                                   | 36. $4 \times 2 \times 5$<br>40                                   | 37. $5 \times 7 \times 0$<br>0                                    | 38. $5 \times 3 \times 6$<br>90                                   |   |

Solve.

39. A supermarket rents rug cleaners for \$3 a day. On Saturday they took in \$24 for renting rug cleaners. How many machines did they rent? 8
40. One carton contains 16 boxes of detergent. How many boxes are there in 6 cartons? 96

- |  |  |  |  |  |
|--|--|--|--|--|
| 21. $\begin{array}{r} 18 \\ 4 \overline{)72} \end{array}$    | 22. $\begin{array}{r} 12 \\ 8 \overline{)96} \end{array}$    | 23. $\begin{array}{r} 13 \\ 7 \overline{)91} \end{array}$    | 24. $\begin{array}{r} 15 \\ 5 \overline{)75} \end{array}$    | 25. $\begin{array}{r} 29 \\ 2 \overline{)58} \end{array}$    |
| 26. $\begin{array}{r} 23R2 \\ 3 \overline{)71} \end{array}$  | 27. $\begin{array}{r} 12R1 \\ 7 \overline{)85} \end{array}$  | 28. $\begin{array}{r} 13R2 \\ 5 \overline{)67} \end{array}$  | 29. $\begin{array}{r} 12R3 \\ 8 \overline{)99} \end{array}$  | 30. $\begin{array}{r} 15R3 \\ 4 \overline{)63} \end{array}$  |
| 31. $\begin{array}{r} 41 \\ 6 \overline{)246} \end{array}$   | 32. $\begin{array}{r} 74 \\ 2 \overline{)148} \end{array}$   | 33. $\begin{array}{r} 42 \\ 4 \overline{)168} \end{array}$   | 34. $\begin{array}{r} 21 \\ 9 \overline{)189} \end{array}$   | 35. $\begin{array}{r} 81 \\ 5 \overline{)405} \end{array}$   |
| 36. $\begin{array}{r} 79 \\ 2 \overline{)158} \end{array}$   | 37. $\begin{array}{r} 42 \\ 8 \overline{)336} \end{array}$   | 38. $\begin{array}{r} 86 \\ 3 \overline{)258} \end{array}$   | 39. $\begin{array}{r} 32 \\ 7 \overline{)224} \end{array}$   | 40. $\begin{array}{r} 69 \\ 6 \overline{)414} \end{array}$   |
| 41. $\begin{array}{r} 43R1 \\ 4 \overline{)173} \end{array}$ | 42. $\begin{array}{r} 32R8 \\ 9 \overline{)296} \end{array}$ | 43. $\begin{array}{r} 85R1 \\ 2 \overline{)171} \end{array}$ | 44. $\begin{array}{r} 57R1 \\ 3 \overline{)172} \end{array}$ | 45. $\begin{array}{r} 42R4 \\ 5 \overline{)214} \end{array}$ |

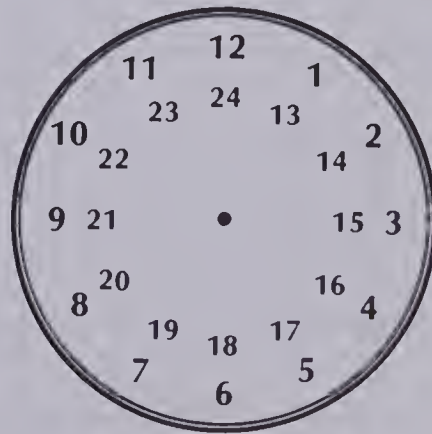
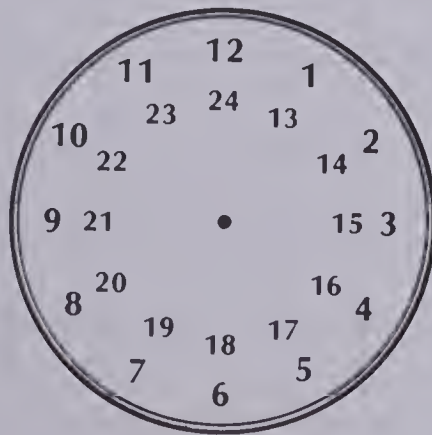
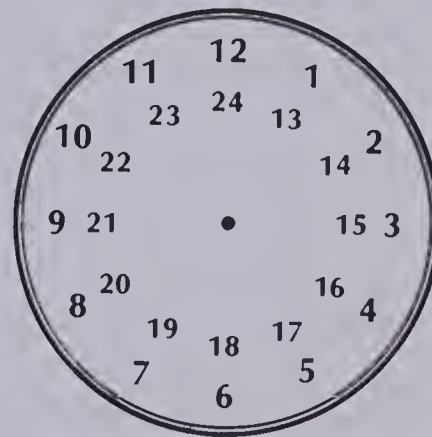
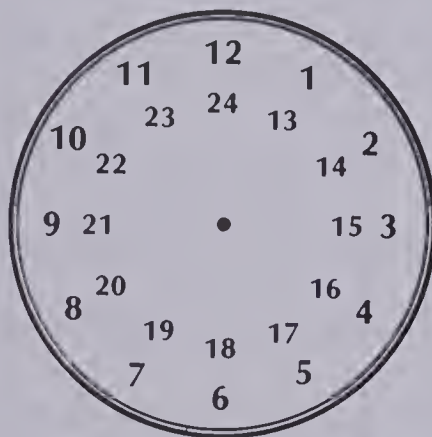
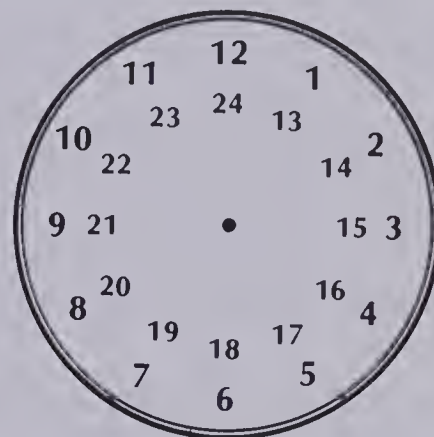
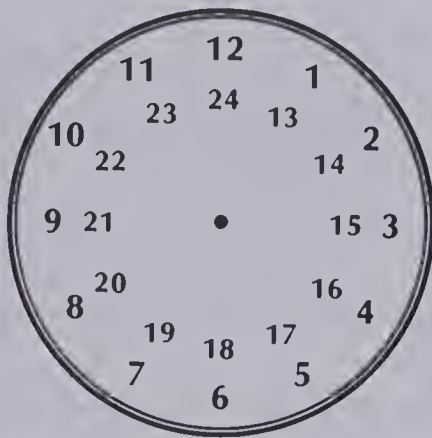
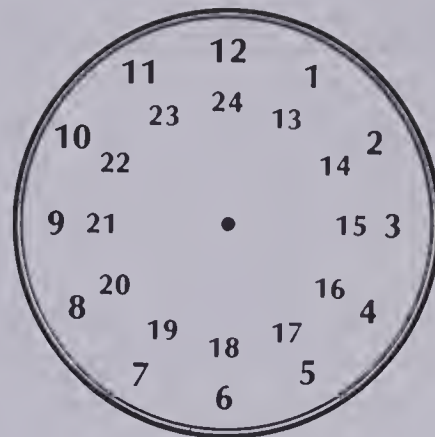
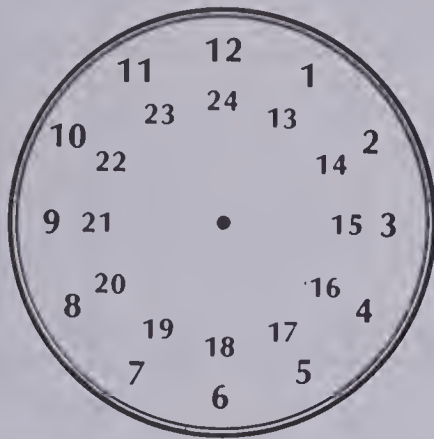
# UNIT 10

## Measurement

Theme: The home

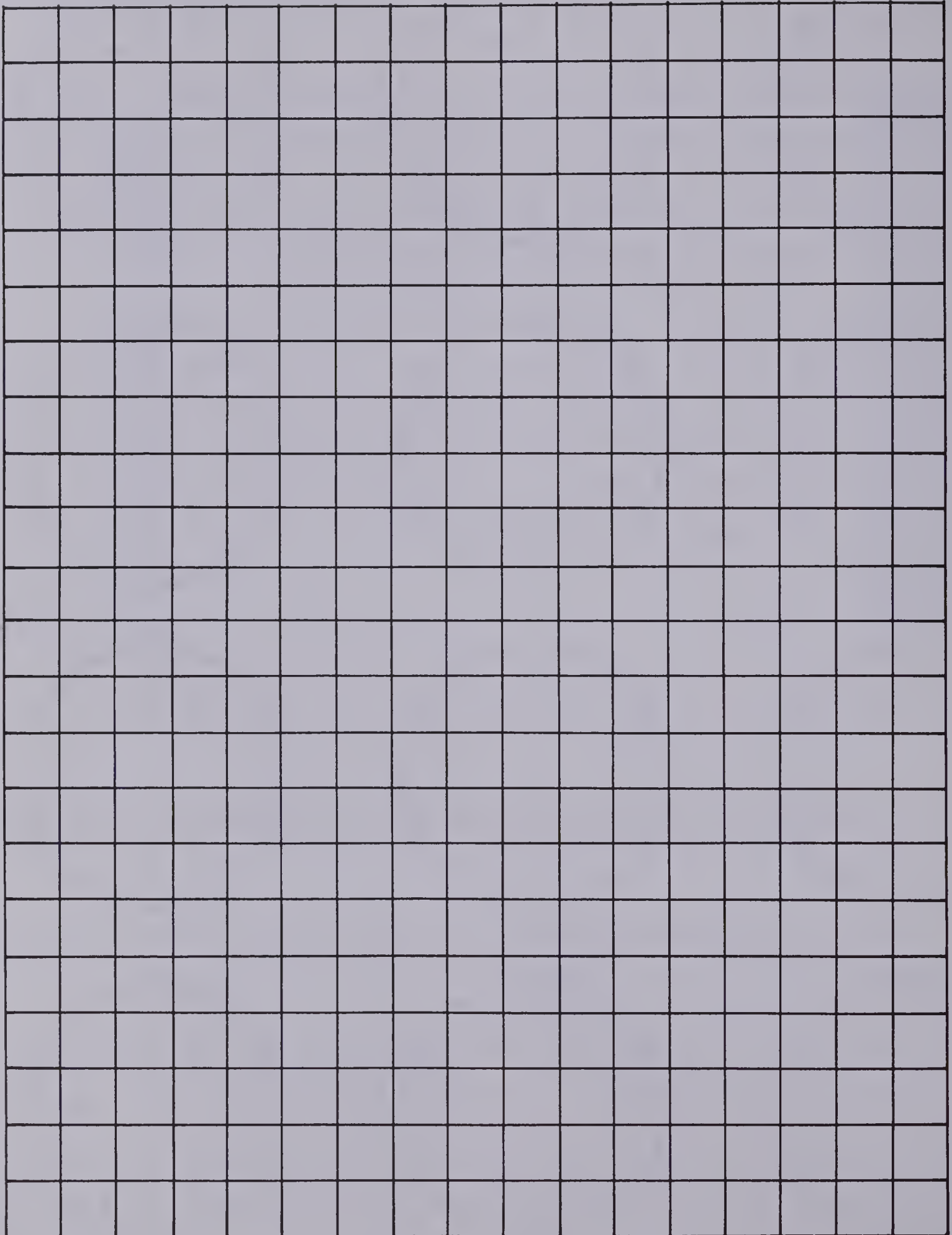
Lesson	Objective		Pages
Preview		Review basic multiplication facts.	213
1	M14	Find area by counting squares or multiplying.	214-215
2	M15	Find area in square centimetres and square metres.	216-217
3	M16	Find volume by counting cubes or multiplying.	218-219
4	M17	Find volume in cubic centimetres and cubic metres.	220-221
5	A55	Find the average of a group of numbers.	222-223
6	A56	Interpret ratios.	224-225
7	M18	Read and interpret a map drawn to scale.	226-227
8	M19	Recognize and use the time units years, months, weeks, days, hours, minutes, and seconds.	228-229
9	M20	Tell time to the minute on the 24 hour clock.	230-231
10	PS10	Recognize problems involving insufficient information.	232-233
Test		Measurement	234
Review		Division	235

# Clock Faces





# 1 cm Grid



# About This Unit

The common units of length, mass, and capacity were studied in Unit 4. The aim of this unit is to apply the previous work to extend the study of measurement to area, volume, averages of measurements, ratios, and map scales. The basic units of time and the 24 hour clock also are studied.

The study of measurement is a **hands-on** process. It is strongly recommended that the students attempt the activities suggested in the *Teacher's Resource Book* in addition to completing the pencil-and-paper work in the textbook and Extra Practice questions. The following materials will be very helpful in a comprehensive study of this unit.

square ceramic tiles or pieces of cardboard,  
    about 3 cm × 3 cm  
metre sticks  
30 cm rulers  
masking tape  
cardboard square centimetres (preferably one  
    for each student)  
set of blocks  
empty cereal boxes  
centimetre cubes  
cubic metre (if possible)  
large boxes  
clock with minute marks along the edge  
clock with second hand  
clock face (can be handmade) of a 24 hour  
    clock  
calendars  
ditto sheets with clock faces marked as 24 hour  
    clocks

# Ideas

The theme of this unit is *the home*. Start a bulletin board display reflecting the use of measurement in the home. Add to the display as each lesson is discussed, having the students contribute examples related to the objective of the day. Some possible examples are noted below.

*Length units:* widths, lengths, heights of rooms, windows, doors, furniture, appliances. These are often cited in advertisements and commercial catalogs that the students may collect for the bulletin board.

*Perimeter:* baseboards around rooms, picture frames, window frames.

*Mass:* packages of food, detergent, and other common household products; bathroom scales.

*Capacity:* common liquid household products, storage tanks (oil, hot water), bathtubs, pails.

*Area:* floor space, tiles, rugs, windows.

*Volume:* refrigerators, cupboards.

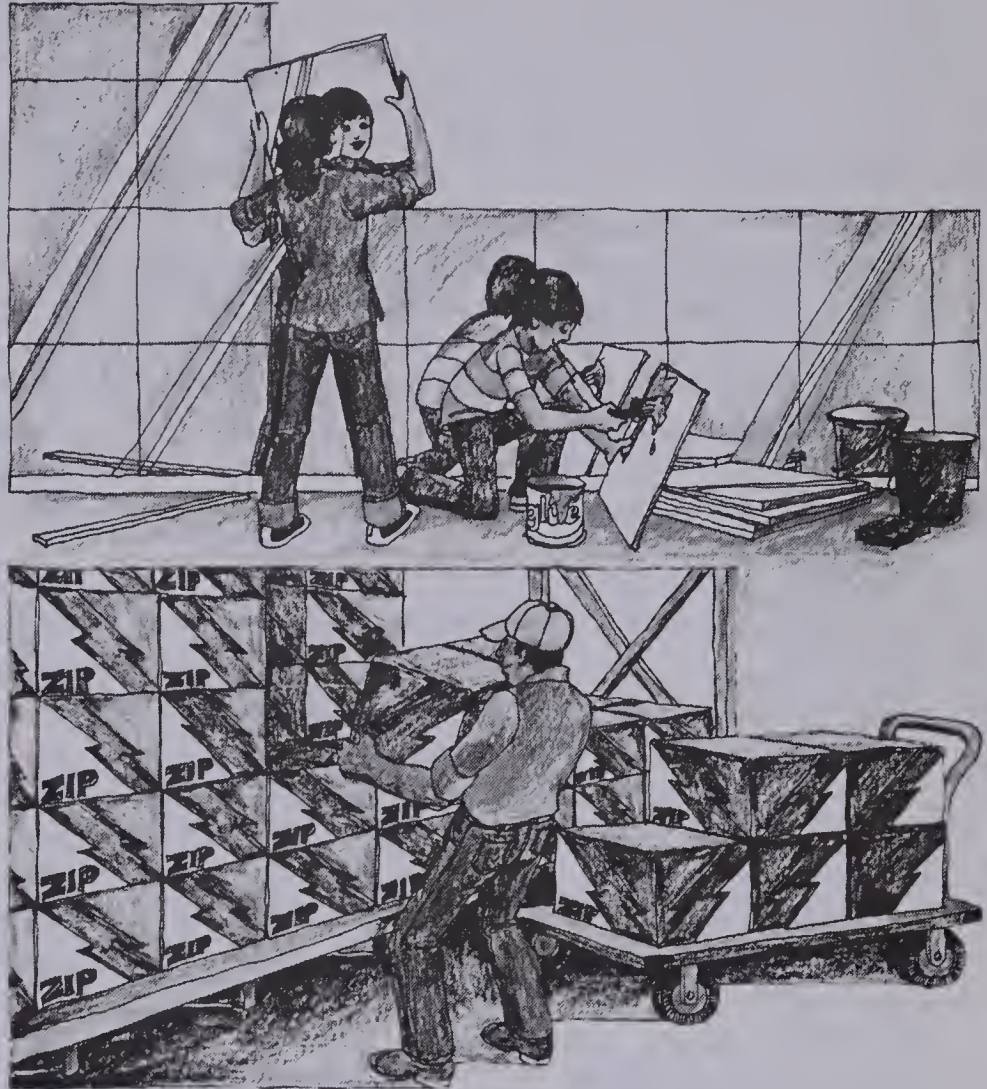
*Ratios:* plans for houses and renovations drawn to scale.

*Time:* various types of household clocks, appointment calendars, schedules (TV guides), timetables.

It is important that time measurement (Lesson 8) not be confined to one lesson. Make it a daily routine. Record the date and day of the week every day. Refer often to time on the clock.

# UNIT 10

## MEASUREMENT



Unit 10 Objective	Test Questions	Pages
M14	1-3	214-215
M15	4-6	216-217
M16	7	218-219
M17	8, 9	220-221
A55	10, 11	222-223
A56	12, 13	224-225
M18	14-16	226-227
M19	17, 18	228-229
M20	19	230-231

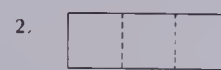
### Pretest

### Unit 10

What is the area?



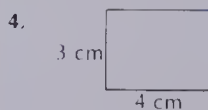
$4\text{cm}^2$



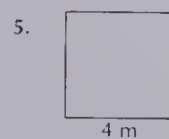
$3\text{cm}^2$



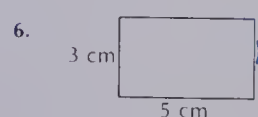
$4\text{cm}^2$



$12\text{cm}^2$



$16\text{m}^2$

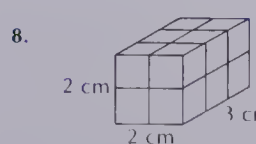


$15\text{cm}^2$

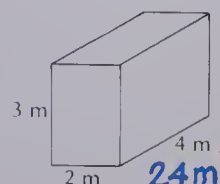
What is the volume?



$3$



$12\text{cm}^3$



$24\text{m}^3$



# Tiling

Can you tile this wall?

## Digit Notice?

For each row, add all the digits in the answers. Do you notice something?

The sum of each is 31.

213

## UNIT 10

## PREVIEW

### Suggestions

Discuss with the students the ways in which painters, paper hangers, roofers, garment makers, and drapery makers use *area* in their jobs.

Discuss work, such as loading boxes or containers, warehousing and moving furniture, in which people use *volume* to do their jobs.

Refer to the pictures on page 212. Discuss with the students how the area problem can be solved by counting the number of mirrors needed to cover the wall. Discuss the volume situation on the bottom of the page. Tell the students that we can solve many problems of area and volume by counting, but if we know how and when to multiply, the problem solving becomes easier.

### About the Page

Ask the students to work through the tiling exercise on page 213 for a multiplication warm up. Make this a race. The winner is the first one to find that the sum of all the digits of the answers for any row is 31.

### Suggestions

Add to the bulletin board display by having students bring examples (from advertisements, catalogs, etc.) of tiles with their sizes identified. Discuss how to figure out how many tiles of a given size are needed to tile a floor of given dimensions. It is impractical and time-consuming to buy too many tiles and try to return the left-overs. Tell students that the next few lessons will show them how to predict the exact number of tiles needed for such a job.

What is the average?

10. 6, 4, 2 4

11. 20, 30, 40, 50, 60 40

Complete each ratio

12. fingers to hands: 5 to 1

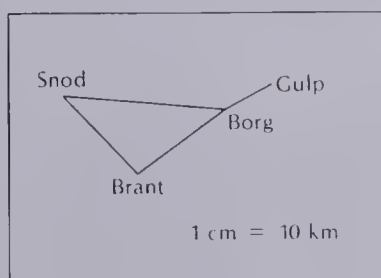
13. wheels to bicycles: 2 to 1

Write each distance

14. Snod to Brant: 20 km

15. Borg to Snod: 30 km

16. Snod to Gulp: 40 km



Complete.

17. one year = 12 months

18. one hour = 60 minutes

19. 8 P.M. = 20:00

# UNIT 10 LESSON 1


## Objective M14

Find area by counting squares or multiplying.


## Introducing the Lesson


Sketch two rectangles on the board, one larger than the other. Ask, "If you were to paint these rectangular figures, which one would need more paint? How do you know?" The answer to be elicited from the students is that one rectangular figure has more surface.

## Teaching the Lesson

Give each pair of students twelve ceramic tiles (or equal-sized cardboard squares). Ask the students to make one row of tiles. 

Ask, "How many tiles in the row?" Tell the students the area is 12 square tiles.

Ask the students to arrange the tiles in a rectangular pattern with 2 rows of tiles. Tell the students the area is still 12 square tiles. 

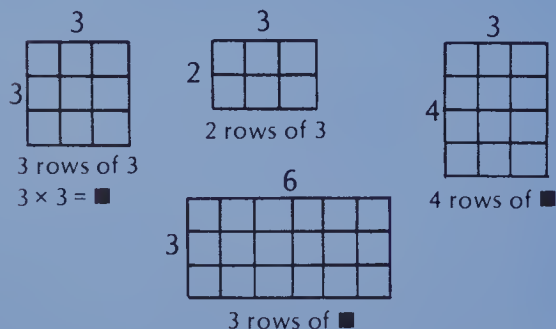
Ask the students to arrange the tiles in a rectangular pattern with 3 rows. Ask the students what the area is. 

Ask the students, "What are we talking about when we talk about area?" Area is the number of square units it takes to cover a surface.

Discuss with the students why square units are used to measure instead of circles. Would rectangles or equilateral triangles work?

Draw the following figures on the board. Have students determine the area by:

- counting the squares, and
- multiplying the number of rows by the number of columns.



## Area

Todd is making a bulletin board for his room. He put 4 squares of cork in the first row. He will make 3 rows.

3 rows of 4  
 $3 \times 4$   
 12 square units of cork

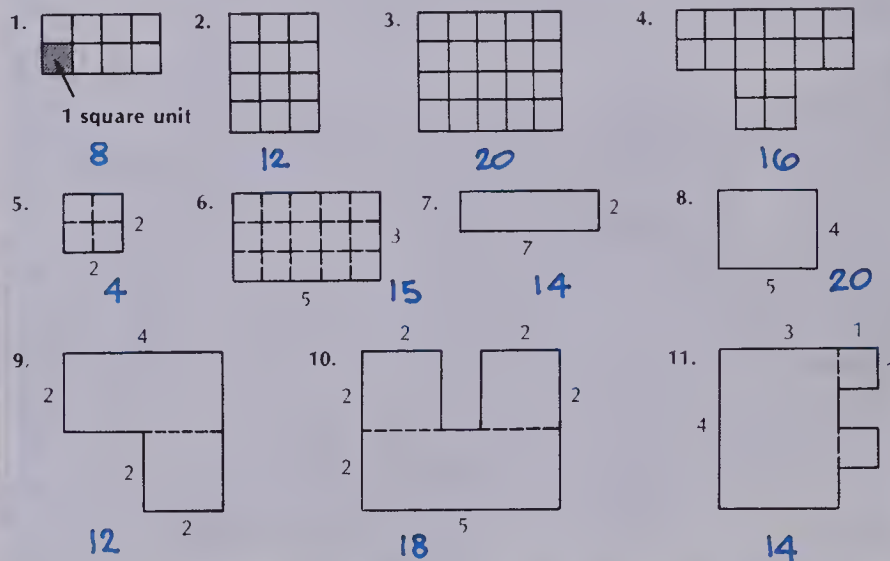
**Area** is the number of units it takes to cover a surface.

The *area* of the bulletin board is 12 square units of cork.



## EXERCISES

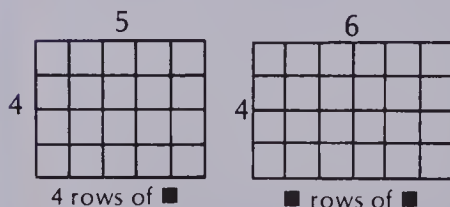
What is the area?



214

## Using the Exercises


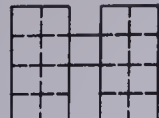
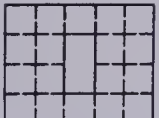
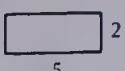

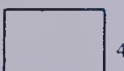
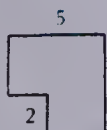
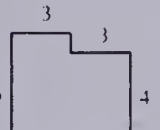
- Point out the green square in question 1. Questions 1 to 6 are to be answered in terms of this square unit. They can be done by counting squares or by multiplying.
- Exercises 7 to 11 *must* be done by multiplying, since a standard unit is not given.





## PRACTICE

What is the area?

-   
18
-   
17
-   
18
-   
10
-   
12
-   
20
-   
21
-   
27

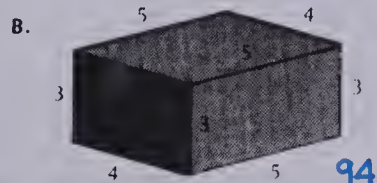
Solve.

- How many mathematics books does it take to cover the top of the teacher's desk? *Answers vary.*
- Take a piece of paper. Estimate how many of your hands will cover it. Trace your hand as many times as you can on the paper. How many "hands" is the paper? *Answers vary.*

## Surface Area

What is the surface area of each box?



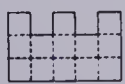
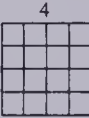
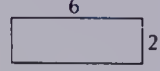
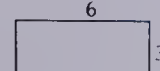
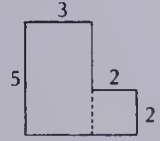

Remember! A box has 6 faces.



215

## Extra Practice

Find each area.

-   
3
-   
6
-   
13
-   
16
-   
12
-   
18
-   
19
-   
10

## Worksheet M14

Pages 214-215

## Assigning the Practice

Minimum: 1-9

Average: 1-10

Enriched: 4-10

## Reinforcement

Provide students with the following worksheet.



- How many white tiles?
- How many shaded tiles?
- How many black tiles?
- Which colour of tile has the greatest area?

Which has the greater area?

- the floor or the side wall of the classroom?
- the front wall or the back wall of the classroom?
- the door or the chalkboard?

## Enrichment

- Assign *Surface Area* on page 215.
- Have the students trace one hand with the fingers together on a piece of grid paper. How many squares are covered by the hand?
- Have them use a piece of grid paper with a different size of grid. Now how many squares are covered by the hand?
- Ask the students to write a rule for finding the area of any rectangle. They may use letters as abbreviations for key words such as area (A), width (W).



# UNIT 10 LESSON 2

## Objective M15

Find area in square centimetres and square metres.

## Introducing the Lesson

Review with the students the lengths one metre and one centimetre. Use a metre stick and a centimetre ruler.

## Teaching the Lesson

Divide the class into three or four teams. Have each team construct one square metre on the floor with masking tape. Let each team see how many students can stand inside the square metre.

With masking tape, construct a square metre on the wall or the floor to serve as a reference for students. Inform students that square metres are used to measure the area of large surfaces, such as floors, rugs, and fields.

Provide each student with one square centimetre of cardboard. Ask each student to tape it to his or her desk to serve as a reference. Discuss with them that small surfaces such as writing paper, stamps, and cards are measured in square centimetres.

Tell the students that there are symbols (short ways of writing) for square centimetre and square metre. They are  $\text{cm}^2$  and  $\text{m}^2$ . Have them practise writing these symbols.

Give the students sheets of paper 8 cm by 12 cm. Have the students use their rulers to measure the length and width of the paper. Show the students how to find the area of the paper by multiplying the length times the width.



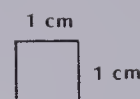
The area is 96 square centimetres or  $96 \text{ cm}^2$ .

Give the students graph paper marked off in square centimetres. Have the students draw figures and find the corresponding areas.

## Area

Here is a square 1 cm long and 1 cm wide.

Its area is one **square centimetre** ( $\text{cm}^2$ )



Small areas are measured in square centimetres.

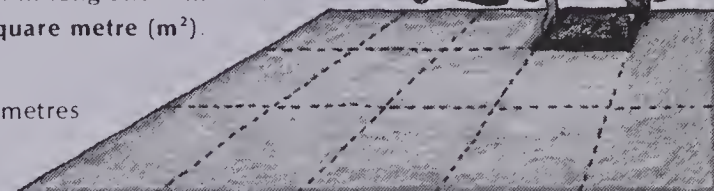


8 square centimetres  
 $8 \text{ cm}^2$

Colette wanted to find the area of a large shape. She used a square 1 m long and 1 m wide. Her unit was one **square metre** ( $\text{m}^2$ ).



15 square metres  
 $15 \text{ m}^2$



## EXERCISES

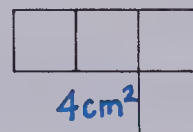
What is the area in square centimetres?

1.



$4 \text{ cm}^2$

2.



$4 \text{ cm}^2$

3.



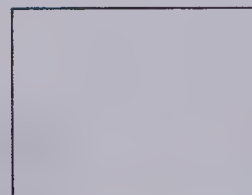
$8 \text{ cm}^2$

4.



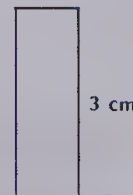
$6 \text{ cm}^2$

5.



$12 \text{ cm}^2$

6.



$3 \text{ cm}^2$

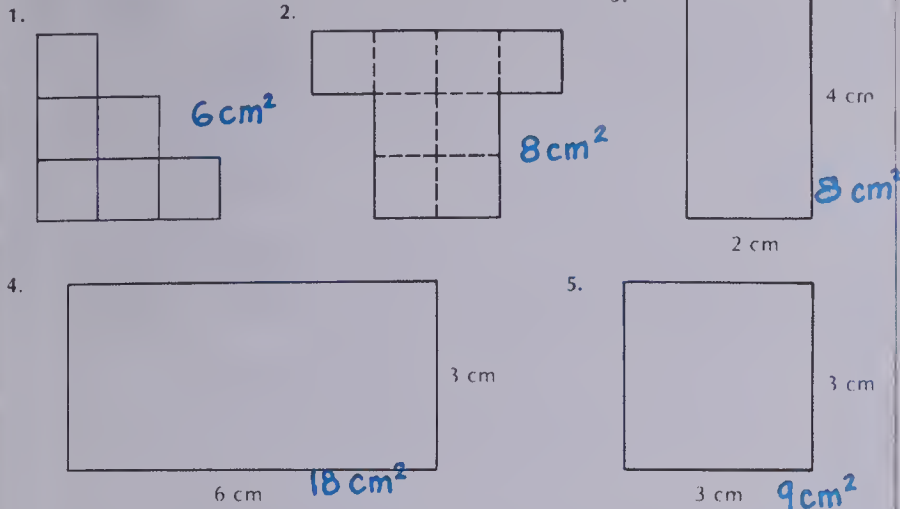
216

## Using the Exercises

- Questions 1 and 2 are answered by counting square centimetres. Check that students are using the correct symbol for the unit ( $\text{cm}^2$ ).
- Questions 3 and 4 can be answered by counting or multiplying. Students should do them both ways to reinforce the concept.
- Questions 5 and 6 must be done by multiplying.

## PRACTICE

What is the area in square centimetres?



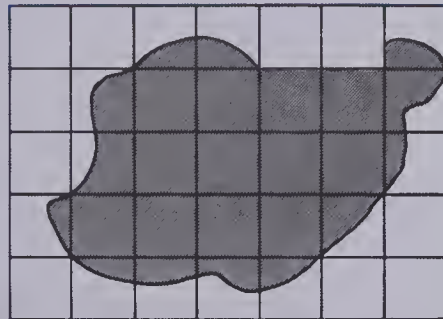
Solve.

6. What is the area of your classroom in square metres? *Answers vary*
7. What is the area of the hallway outside your classroom in square metres? *Answers vary.*

## Estimating Areas

1. How many  $\square$ s are covered by the figure? (Count  $\square$ s that are partly covered too.)  $25$
2. How many  $\square$ s are completely covered by the figure?  $12$
3. Estimate the area of the figure.  
Hint: It is an amount between your first answer and your second answer

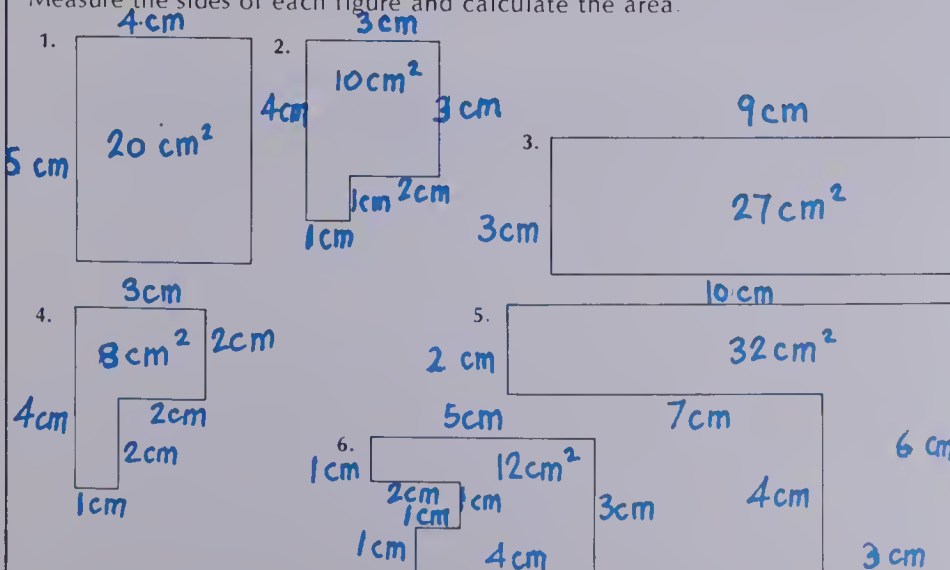
*Answers may vary.  
Approx. 17.*



217

## Extra Practice

Measure the sides of each figure and calculate the area.



## Worksheet M15

Pages 216-217

## Assigning the Practice

Minimum: 1-6

Average: 1-7

Enriched: 3-7

## Reinforcement

Ask the students to solve these problems.

- Find three surfaces that have an area of more than one square metre.
- Find three surfaces that have an area of less than one square metre.
- Name three surfaces that would be measured in square centimetres.

Would you use  $\text{m}^2$  or  $\text{cm}^2$  to find the area of the following?

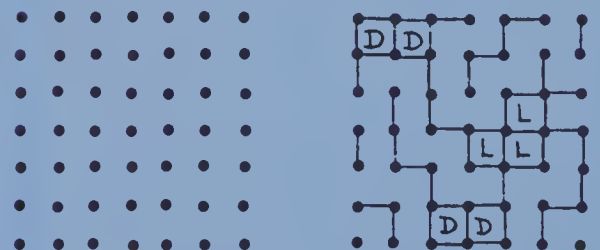
- |                 |                    |
|-----------------|--------------------|
| 4. ceiling      | 5. back yard       |
| 6. snap shot    | 7. wallpaper       |
| 8. stamp        | 9. your hand       |
| 10. hockey rink | 11. sheet of paper |

## Enrichment

1. Assign *Estimating Areas* on page 217. Have students draw other closed figures freehand on grid paper. Then they can estimate the areas of these figures.

2. Pairs of students may play "Squares", as follows.

On a sheet of paper, mark off a rectangular array of dots. Take turns with a friend joining any two dots (horizontally or vertically). If you complete a square, it is yours and you initial it.



Continue until all the squares have been drawn. The player who has initialed the greater area wins.

# UNIT 10 LESSON 3

## Objective M16

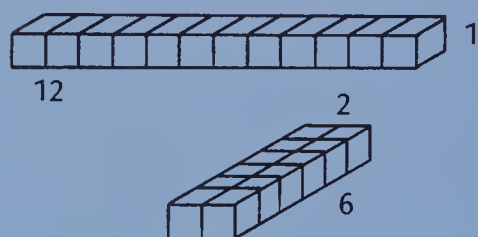
Find volume by counting cubes or multiplying.

### Introducing the Lesson

Display three or four cereal boxes of various sizes. Ask students to arrange them from smallest to largest. Does the tallest always hold the most? Conclude that volume refers to amount of space occupied. We measure space using cubic units such as blocks or cubes.

### Teaching the Lesson

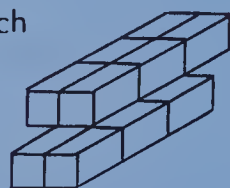
Give each pair of students 12 blocks or cubes. Have them make rectangular structures. Ask them to find the volume of the solid by counting. Then fill in the table and find volume by multiplying the three numbers.



Number of rows	Number of blocks in each row	Number of layers	Volume (number of blocks)
1	12	1	12
2	6	1	12
2	3	2	12
2	2	3	12
1	1	12	12

Count the number in each layer.

$$6 \times 2 = 12$$



Multiply by the number of layers. Emphasize that it is usually easier to find the volume by multiplying.

Give the students 8 cubes. Have them arrange the cubes in as many different ways as they can. What will the volume of each shape be?

Have the students use only 4 cubes and arrange the cubes in as many different ways as they can. What will the volume of each shape be?

## Volume

Martin put away his little brother's blocks in a box. He put in 3 rows of 4 blocks to make the first layer. Then he put in 2 more layers. How many blocks were in the box?

$$\begin{aligned} \text{each layer:} & \quad 3 \times 4 = 12 \\ \text{three layers:} & \quad 3 \times 12 = 36 \end{aligned}$$

There were 36 blocks in the box.

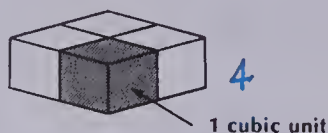
The **volume** of the box was 36 blocks or cubes.



### EXERCISES

What is the volume of each solid?

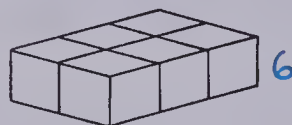
1.



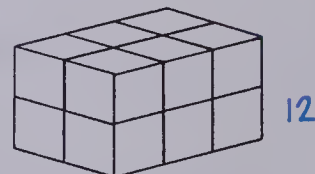
2.



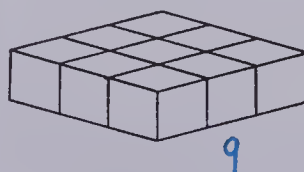
3.



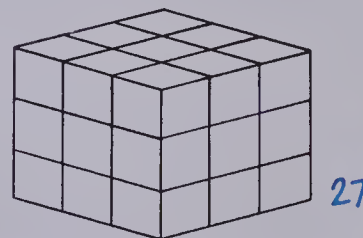
4.



5.



6.



218

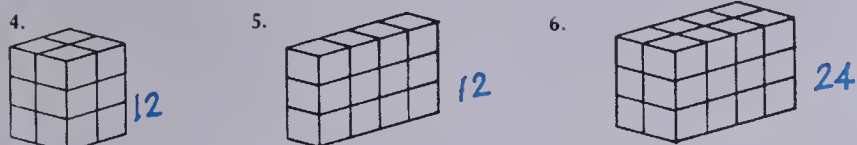
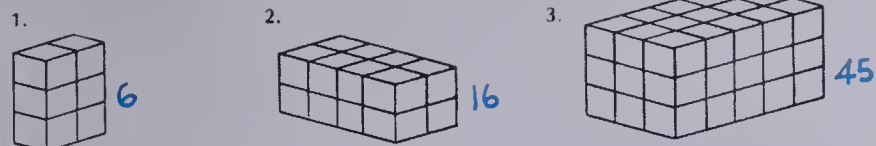
### Using the Exercises

- Point out that the green cube is the standard measure for all of questions 1 to 6.
- The questions are arranged in pairs. Question 2 has two layers of the cubes in question 1. Question 4 has 2 layers of the cubes in question 3. Question 6 has 3 layers of the cubes in question 5.



## PRACTICE

What is the volume of each solid?



Multiply

7.  $2 \times 4 \times 2$  16

8.  $3 \times 3 \times 2$  18

9.  $3 \times 4 \times 2$  24

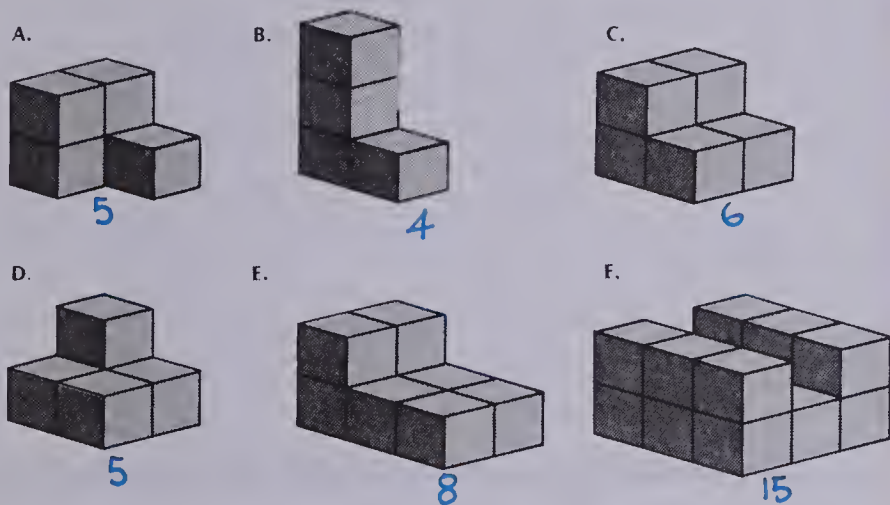
10.  $2 \times 5 \times 3$  30

11.  $3 \times 6 \times 3$  54

12.  $4 \times 5 \times 4$  80

## How Many?

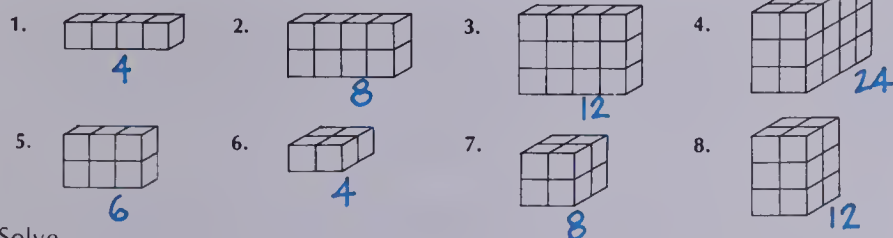
How many cubes are in each set? Count carefully!



219

## Extra Practice

What is the volume of each solid?



Solve.

9. A box has 4 cubes in one layer. There are 5 layers. What is the volume? 20
10. A box has 5 layers. Each layer has 10 cubes. What is the volume? 50

## Worksheet M16

Pages 218-219

## Assigning the Practice

Minimum: 1-9

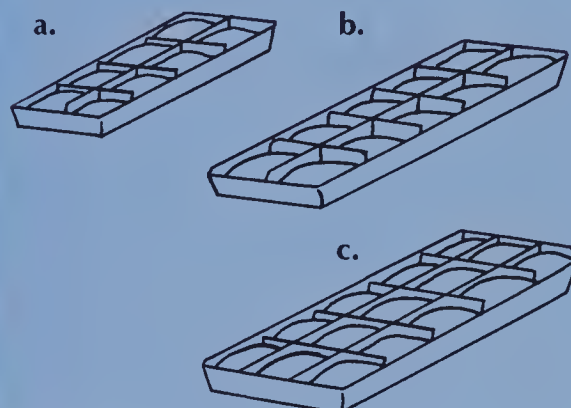
Average: 1-12

Enriched: 1-12

## Reinforcement

1. Assign *How Many?* on page 219. Ask what assumptions they made, especially for part F which could have 13, 14, or 15 cubes.

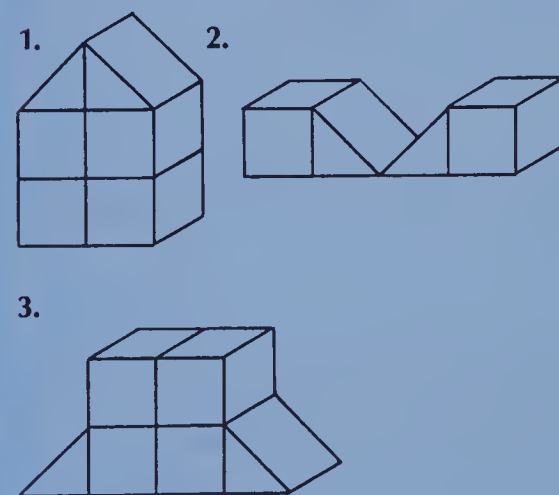
2. Ask how many ice cubes there are in each tray.



3. Assign this problem.  
A box has 24 chocolates in a layer. It has 2 layers. How many chocolates are there?

## Enrichment

The pupils are to decide what is each volume in cubic units.



4. Have the students write a rule for finding the volume of any rectangular solid. Use letters as abbreviations for key words such as length ( $L$ ), volume ( $V$ ).

# UNIT 10 LESSON 4

## Objective M17

Find volume in cubic centimetres and cubic metres.

### Introducing the Lesson

Give the students the following problem: Your parents want to order some top soil for the garden. How would they order it? By the cupful? shovelful? wheelbarrow full? by the bag? by the cubic metre? by the truck load? Discuss the students' responses.

### Teaching the Lesson

With the students, build a large box that measures  $1\text{ m} \times 1\text{ m} \times 1\text{ m}$ . (One-metre tubes can be made from rolled newspaper.) With the metre stick, show how it measures  $1\text{ m} \times 1\text{ m} \times 1\text{ m}$ . See how many students can fit into a cubic metre box. Tell students that large volumes are measured in cubic metres.

Show the students a cubic centimetre. Point out that the tip of a finger is about one cubic centimetre in volume. The students could measure a finger and mark off 1 cm from the tip to get an idea of a cubic centimetre. Ask students to form a  $2 \times 3$  layer of centimetre cubes.



How many rows are there? How many cubes in each row? How do you know there are 6 cubes in all?  $2 \times 3 = 6$ .

Add one more layer.



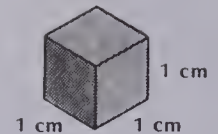
How many in one layer? How many in two layers? Lead the students to conclude that volume can be found by counting or by multiplying.

Volume = number of cubes in each layer multiplied by the number of layers.

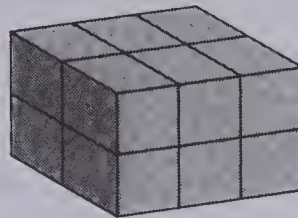
Refer to the textbook page and point out the symbols  $\text{cm}^3$  and  $\text{m}^3$ . How are they similar to area symbols? How are they different? Why do you think they use a "3"? (We multiply 3 lengths to get the volume.)

## Volume

A cube 1 cm long, 1 cm wide, and 1 cm high has a volume of one **cubic centimetre** ( $\text{cm}^3$ ).



Small volumes are measured in cubic centimetres.



$$3 \times 2 \times 2 = 12$$

12 cubic centimetres  
 $12\text{ cm}^3$

Mr. Simpson wanted to find the volume of his van. He used a unit 1 m long, 1 m wide, and 1 m high. It is called a **cubic metre** ( $\text{m}^3$ ).

$$3 \times 5 \times 3 = 45$$

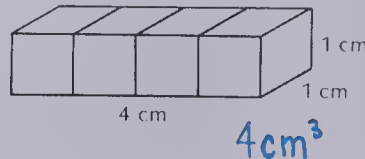
45 cubic metres  
 $45\text{ m}^3$



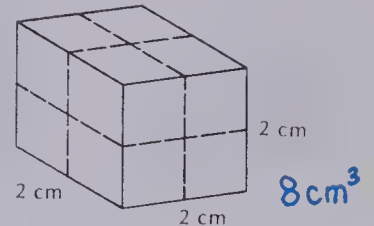
### EXERCISES

What is the volume?

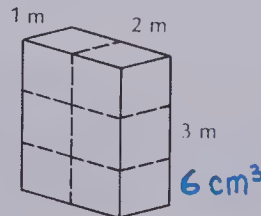
1.



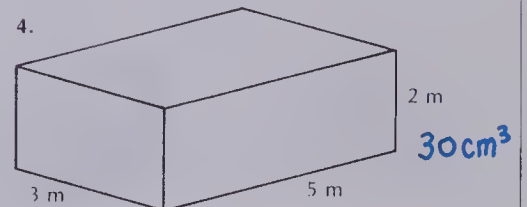
2.



3.



4.



220

### Using the Exercises

- Questions 1 and 3 can be done by counting cubes. Show that multiplying gives the same result.
- Question 2 can be done by counting cubes if students remember to count the hidden cube. Point out that it may not always be so easy to count the hidden cubes.
- Question 4 must be done by multiplication.

## PRACTICE

What is the volume?

1.  $12 \text{ cm}^3$
2.  $24 \text{ cm}^3$
3.  $54 \text{ m}^3$
4.  $36 \text{ cm}^3$
5.  $32 \text{ cm}^3$

Would you use cubic metres or cubic centimetres to measure the following?

- a truckload of gravel  $\text{m}^3$
- the volume of a pencil box  $\text{cm}^3$

## REVIEW

How many  $\square$ s in each surface?

1.  $6$
2.  $8$
3.  $12$

What is the area in square metres or square centimetres?

4.  $10 \text{ m}^2$
5.  $9 \text{ cm}^2$
6.  $28 \text{ cm}^2$

How many  $\square$ s in each solid?

7.  $8$
8.  $12$
9.  $18$

What is the volume?

10.  $50 \text{ m}^3$
11.  $24 \text{ cm}^3$
12.  $30 \text{ m}^3$

221

## Assigning the Practice

Minimum: 1-5

Average: 1-7

Enriched: 1-7

## Review Exercises

Questions	Objective	Pages
1-3	M14	214-215
4-6	M15	216-217
7-9	M16	218-219
10-12	M17	220-221

## Reinforcement

1. Using the centimetre cubes, have the students make structures and tell what the volume of each is. Have them share what they make with the class. The class will try to estimate the volume of each structure.

2. Ask students to construct a cubic metre out of any material they choose. (Have the students work in pairs.)

3. Display a selection of small boxes and ask students to estimate the volume of each box in cubic centimetres. Then ask the students to measure the boxes and calculate the volumes to check their estimates.

## Enrichment

Ask the pupils to estimate the volume of a box that is the size of:

- a kitchen stove
- a refrigerator
- the teacher's desk
- a student's desk

## Extra Practice

What is the volume?

1.  $8$
2.  $18$
3.  $18 \text{ m}^3$
4.  $16$
5.  $18$
6.  $24 \text{ m}^3$

Solve

- One layer of a box has 4 cubic centimetres. The box has 4 layers. How many cubic centimetres in all?  $16 \text{ cm}^3$
- Each layer of a box measures 4 cm by 2 cm. It is 4 cm high. What is the volume of the box?  $32 \text{ cm}^3$

## Worksheet M17

Pages 220-221



# UNIT 10 LESSON 5

## Objective A55

Find the average of a group of numbers.

### Introducing the Lesson

Give the students the following problem.

The Lawson family went on their holiday by car. The first day they drove 510 km. The second day they drove 481 km. The third day they drove 502 km.

List the numbers on the board. Ask the students to tell about how far the Lawsons drove each day. Point out that the Lawsons might have responded, "On the average, we drove 500 km each day." Or, "We averaged 500 km each day." This doesn't mean that they drove exactly that much each day. Some days they drove more and other days less.

### Teaching the Lesson

Tell the students that there is an exact way to find averages rather than just estimating. Refer to the example on page 222. Read through the example. Point out that the average, 40, is the number that would give the same total time spent on homework if Tina worked that long every night. Demonstrate this.

$$35 + 50 + 30 + 45 = 160$$

$$40 + 40 + 40 + 40 = 160$$

## Average

Tina kept a record of how long her homework took her. About how long did Tina spend on her homework each night?

Mon.	35 min
Tues.	50 min
Wed.	30 min
Thurs.	45 min

Find the **average** number of minutes.

Step 1. Add the numbers.

$$35 + 50 + 30 + 45 = 160$$

Step 2. Since 4 numbers were added, divide by 4.

$$160 \div 4 = 40$$

Answer. The average number of minutes Tina spent on homework was 40.

### EXERCISES

What is the average?

1. Age: 2 years  
4 years  
+ 6 years  
12 years

$$12 \text{ years} \div 3 = \blacksquare 4$$

The average age is  $\blacksquare 4$  years

2. Length: 3 cm  
4 cm  
6 cm  
+ 7 cm  
20 cm

$$20 \text{ cm} \div 4 = \blacksquare 5$$

The average length is  $\blacksquare 5$  cm

3. Mass: 1 g  
2 g  
3 g  
4 g  
+ 5 g  
15

$$15 \div 5 = \blacksquare 3$$

The average mass is  $\blacksquare 3$  g

4. Scores: 60  
75  
80  
+ 85  
300

$$300 \div 4 = \blacksquare 75$$

The average score is  $\blacksquare 75$

222

### Using the Exercises

- The questions are partly worked out. Emphasize finding the right divisor (total number of items). Check question 4 to make sure students have the right idea before assigning the Practice.

## PRACTICE

What is the average?

$$\begin{array}{r} 1 \\ 3 \\ 4 \\ + 8 \\ \hline 16 \end{array}$$

$$16 \div 4 = 4$$

The average is 4.

$$\begin{array}{r} 3 \\ 4 \\ 6 \\ 7 \\ + 10 \\ \hline 30 \end{array}$$

$$30 \div 5 = 6$$

The average is 6.

$$\begin{array}{r} 3 \\ 4 \\ 7 \\ + 10 \\ \hline 24 \end{array}$$

$$24 \div 4 = 6$$

The average is 6.

$$\begin{array}{r} 4 \\ 5 \\ 7 \\ 8 \\ + 11 \\ \hline 35 \end{array}$$

The average is 7.

$$\begin{array}{r} 10 \\ 20 \\ 30 \\ 40 \\ + 50 \\ \hline 150 \end{array}$$

The average is 30.

$$\begin{array}{r} 80 \\ 95 \\ 75 \\ 95 \\ 100 \\ + 95 \\ \hline 540 \end{array}$$

The average is 90.

7. Joe does chores for his family. What is the average length of time Joe works on school days?

Mon.	Tues.	Wed	Thurs	Fri
60 min	30 min	45 min	90 min	45 min

54 min

## Paper Calculators

- Cut 4 strips of paper these lengths: 58 cm, 72 cm, 36 cm, and 22 cm. Show that the average length is 47 cm:
  - Tape the 4 strips end to end.
  - Fold the new strip in half. Fold it in half again.
  - Measure the length of the folded strip.
  - Explain why its length is 47 cm.
- Find the average height of 8 students by using a paper calculator.

Answers vary

223

## Assigning the Practice

Minimum: 1-7

Average: 1-7

Enriched: 1-7

## Reinforcement

1. Assign *Paper Calculators* on page 223. For part 2, actually cut a paper strip equal to the height of each student. Then tape the strip together, fold it in half, and then fold in half again. Measure the folded strip in centimetres.

2. Explain that a recent survey showed that students watch an average of 3 hours of TV a day. Ask, "What does this mean? Does it mean that every child watches exactly 3 hours of TV each day?"

## Enrichment

Assign these problems.

- Use the newspaper. Choose a sport such as hockey. List the scores and find the average goals scored. Do several similar examples.
- A basketball player scored an average of 12 points a game last season. If she played 10 games, what was the total number of points she scored?
- Find the average.
  - Exam marks:
    - math, 91
    - social studies, 58
    - English, 76
    - physical education, 82
  - Allowances:
    - Sue, \$1.50
    - John, \$2.00
    - Ali, \$3.25
    - Misha, \$1.75

## Extra Practice

Find the average.

$$\begin{array}{r} 2 \\ 5 \\ + 8 \\ \hline 15 \end{array}$$

5

$$\begin{array}{r} 4 \\ 7 \\ 8 \\ + 9 \\ \hline 28 \end{array}$$

7

$$\begin{array}{r} 3 \\ 5 \\ 7 \\ + 9 \\ \hline 24 \end{array}$$

6

$$\begin{array}{r} 4 \\ 7 \\ 9 \\ 10 \\ + 15 \\ \hline 45 \end{array}$$

9

$$\begin{array}{r} 18 \\ 22 \\ + 20 \\ \hline 60 \end{array}$$

20

$$\begin{array}{r} 7 \\ 5 \\ + 6 \\ \hline 18 \end{array}$$

6

$$\begin{array}{r} 1 \\ 3 \\ 7 \\ + 9 \\ \hline 20 \end{array}$$

5

$$\begin{array}{r} 4 \\ 5 \\ 7 \\ + 8 \\ \hline 24 \end{array}$$

6

$$\begin{array}{r} 5 \\ 10 \\ 15 \\ 25 \\ + 30 \\ \hline 85 \end{array}$$

17

$$\begin{array}{r} 50 \\ 300 \\ 500 \\ 600 \\ + 100 \\ \hline 1550 \end{array}$$

310

Solve.

11. Nancy read for 5 minutes on Thursday, 10 minutes on Friday, 20 minutes on Saturday, and 25 minutes on Sunday. How long did she read each day, on the average?

15 min

## Worksheet A55

Pages 222-223

UNIT 10

LESSON 6

Objective A56

Interpret ratios.

Introducing the Lesson

Ask the students to plan the refreshments for a party. How many hot dogs would they order for each student? How many drinks? How many cookies? How many apples? Make a chart on the board.

hot dogs	2 for each
drinks	2 for each
cookies	3 for each
apples	1 for each

Teaching the Lesson

Show the students how to express the information in the chart as ratios: 2 to 1  
3 to 1  
1 to 1

Ask the students what is the ratio of textbooks to students in their class. What is the ratio of hockey players to a team?

Sketch three stick people on the board and ask the students to complete the sketch with a ratio of 3 balloons per person. How many balloons are there in all? (Also, call attention to the word **per**.)

Work through the lesson example with the students.

Ratio

Pauline baked cookies for supper. She wanted to put enough on the plate so that there were 3 cookies for each person

The **ratio** of cookies to people is 3 to 1.  
3 cookies for 1 person.  
6 cookies for 2 people.  
9 cookies for 3 people.

How many cookies for 5 people?  
 $5 \times 3 = 15$   
15 cookies for 5 people.



EXERCISES

What is the ratio?

- There are 2 scoops of ice cream for each child.  
The ratio is **2** to 1.
- There are 4 meatballs for each person.  
The ratio is **4** to 1.
- There is 1 chair for each person.  
The ratio is **1** to 1.
- 3 balloons cost 10¢.  
The ratio of balloons to cents is **3** to 10.
- On a school trip there were 2 adults for every 9 children. The ratio of adults to children was **2** to 9.

How many are needed?

- 2 hamburgers **per** person. 5 people. **10**
- 1 party hat **per** person. 6 people. **6**
- 3 prizes **per** person. 4 people. **12**

224

Using the Exercises

- Questions 1 to 5 help to familiarize the students with the usual form of a ratio statement. The second number is given in each case.
- In questions 6 to 8, remind students of the meaning of *per*. For example, every person gets 2 hamburgers: there are 2 hamburgers per person. Be sure they understand how to multiply to get the answers before assigning the Practice.



## PRACTICE

Complete.

- The ratio of fingers to hands is 5 to 1.
- The ratio of hands to people is 2 to 1.
- The ratio of eyes to people is 2 to 1.
- The ratio of legs to people is 2 to 1.
- The ratio of toes to people is 10 to 1.
- The ratio of noses to people is 1 to 1.
- Copy and complete the chart.

Number of people	1	2	3	5	8	10	12
Cost of show tickets	50¢	\$1.00	\$1.50	\$2.50	\$4.00	\$5.00	\$6.00

Solve.

- How much do 5 hamburgers cost? \$4.25
- How much do 6 milk shakes cost? \$4.80
- How much do 4 orders of fries cost? \$2.00
- How much do 3 soft drinks cost? \$1.35

MENU	
Hamburgers	85¢
Milk shakes	80¢
Fries	50¢
Soft drinks	45¢

## Ratio Problem Charts

Copy and complete the charts.

A.

Number of students	1	2	3	5	8	10	12
Cost of tickets	25¢	50¢	75¢	\$1.25	\$2.00	\$2.50	\$3.00

B.

Number of students	3	6	12	15	18	21	24
Pizzas needed	2	4	8	10	12	14	16

225

## Assigning the Practice

Minimum: 1-7

Average: 1-11

Enriched: 1-11

## Reinforcement

1. Assign Ratio Problem Charts on page 225.

2. Ask the students to copy and complete.

- The ratio of squares to stars is \_\_\_ to \_\_\_.
- The ratio of balls to squares is \_\_\_ to \_\_\_.
- The ratio of squares to triangles is \_\_\_ to \_\_\_.
- The ratio of triangles to stars is \_\_\_ to \_\_\_.
- The ratio of balls to triangles is \_\_\_ to \_\_\_.



## Enrichment

Have the students match.

- |                   |               |
|-------------------|---------------|
| 1. 6¢ per stamp   | A. 5 for 95¢  |
| 2. \$2 per litre  | B. 6 for 90¢  |
| 3. 19¢ per eraser | C. 2 for 12¢  |
| 4. 1¢ per candy   | D. 19 for 19¢ |
| 5. 15¢ per apple  | E. 3 for \$6  |

## Extra Practice

## Worksheet A56

Pages 224-225

What is the ratio?

- socks to people: 2 to 1
- days to weeks: 7 to 1
- eggs to dozens: 12 to 1

Solve.

- How many socks for 5 people? 10
- How many days in 3 weeks? 21
- How many eggs in 7 dozen? 84
- At Joey's house there are 2 people per bedroom. There are 6 people in the family. How many bedrooms do they have? 3

# UNIT 10 LESSON 7

## Objective M18

Read and interpret a map drawn to scale.

## Introducing the Lesson

Look at several maps: a large road map, a wall map of a province, etc.

Discuss what you can learn by glancing briefly. Discuss what you can tell with the help of a scale.

## Teaching the Lesson

Refer to the map in the text. The scale is 1 cm to 1 km. Stress that 1 cm is the *map* distance and 1 km is the *real* distance. Find how far it is from the school to the market. Use a ruler to measure (2 cm). The distance is 2 km. Find the distance between other places on the map. Refer to the road map or to a wall map. Discuss the scale and decide on distances.

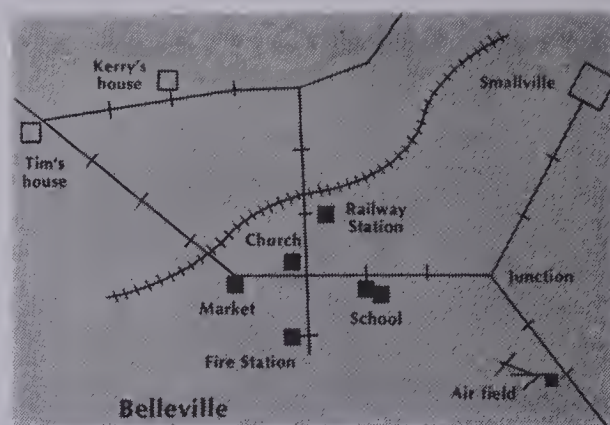
On the overhead, put a transparency of a map similar to the one on page 226 of the text. It is easier and more effective to illustrate on an overhead than from a text book picture.

## Map Scale

1 cm on this map represents 1 km in Belleville.

The scale is 1 cm = 1 km.

Scale 1 cm = 1 km  
0 1 2 3  
kilometres



On the map, it is 2 cm from Tim's house to Kerry's house. This means that the real distance is 2 km.

## EXERCISES

Use a ruler and the scale to find the distance from:

1. Tim's house to the market **4 km**
2. the market to the church **1 km**
3. the railway station to the fire station **2 km**
4. the market to the school **2 km**
5. Tim's house to school **6 km**
6. the school to the Junction **2 km**
7. the Junction to Smallville **3 km**
8. the school to Smallville **5 km**
9. Which is farther — the distance from Tim's house to the railway station or to the air field? **Air field**  
How much farther? **4 km farther**

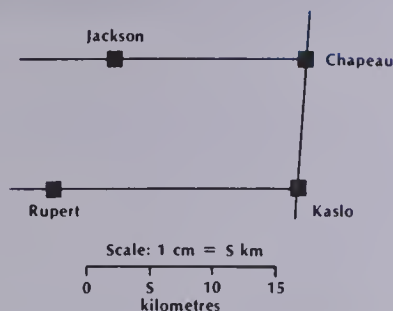
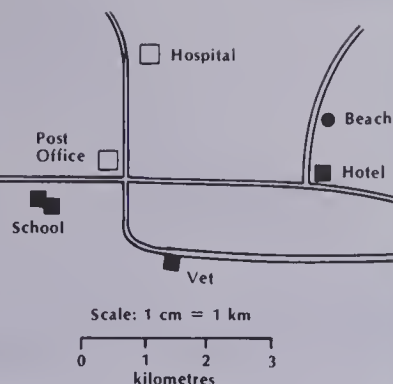
## Using the Exercises

- Questions 1 to 9 require the student to understand the scale and its relation to the map. Those having difficulty should use centimetre cubes to measure the distance between points.

## PRACTICE

Use a ruler and the scale to find the distance:

- from the beach to the hotel **1 km**
- from home to school **2 km**
- from home to the post office **3 km**
- from the post office to the hospital **2 km**
- from home to the vet. **5 km**



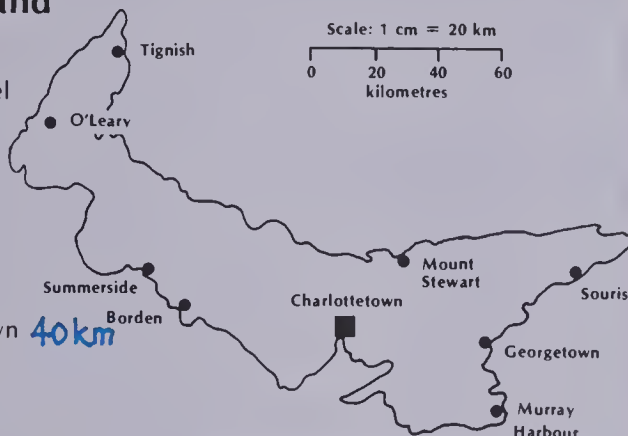
Use a ruler and the scale to find the distance:

- from Jackson to Chapeau **15 km**
- from Chapeau to Kaslo **10 km**
- from Kaslo to Rupert **20 km**
- from Chapeau to Rupert **30 km**
- from Jackson to Kaslo. **25 km**

## Prince Edward Island

Suppose you had a helicopter and could travel in a straight line. What is the distance between the following places:

- Charlottetown and Souris **80 km**
- Souris and Georgetown **40 km**
- Murray Harbour and Tignish **160 km**
- Borden and Mount Stewart **70 km**



227

## Assigning the Practice

Minimum: 1-8  
Average: 1-10  
Enriched: 1-10

## Reinforcement

1. Assign *Prince Edward Island* on page 227.

2. Provide a map of the area. The students write down the scale; choose a place on the map; find the distance from this place to 3 other places on the map.

3. Provide a map of the province. The students write down the scale, choose a town or city, and find the distance to 3 other places on the map.

4. Those having difficulty should work with simpler maps and larger scales. Find a large scale in an atlas. Then have the pupils practise finding distances from one place to another.

## Enrichment

1. Have the student make a map to scale of his or her room. Be sure that they state the scale. Have them map in large pieces of furniture.

2. Have the student make a map to scale of the street or road where he or she lives. Have them state the scale. They should include all houses, apartments, farms, etc.

## Extra Practice

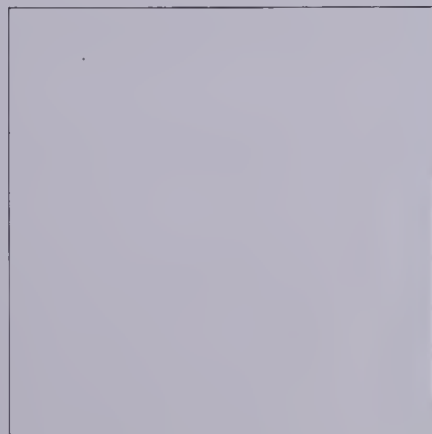
Draw a map with the scale: 1 cm = 1 km. Make your map so that the following distances are correct.

- Ajax to Beetown: 7 km  
Beetown to Bury: 3 km  
Bury to Orville: 5 km

What are these distances on your map?

- Beetown to Orville \_\_\_\_\_
- Ajax to Bury \_\_\_\_\_
- Orville to Ajax \_\_\_\_\_

Answer to the nearest kilometre.



## Worksheet M18

Pages 226-227



## UNIT 10 LESSON 8

### Objective M19

Recognize and use the time units years, months, weeks, days, hours, minutes, and seconds.

### Introducing the Lesson

Ask the students to name activities that involve time. List these activities on the board. Discuss with the students the importance of time measurement in our society.

Sample list:

hockey	travel	school
football	work	recess
most sports	mealtime	

### Teaching the Lesson

Make time measurement a daily classroom routine as suggested in the introduction.

Have the students “feel” how long a minute is by having them close their eyes and open them when they think a minute has passed.

Ask the students to watch the second hand of a large clock and have them count and clap—60 seconds for one minute. Then without their watching the clock have them count and clap 60 times and see how close they come to one minute.

Show the students a clock with a face similar to the one on the student’s page. The face of a clock has only the numbers 1 through 12 on it to represent hours. But there are 60 marks along the edge of the circle. Discuss that these can be used to read minutes or seconds. Practise reading minutes and seconds on the clock.

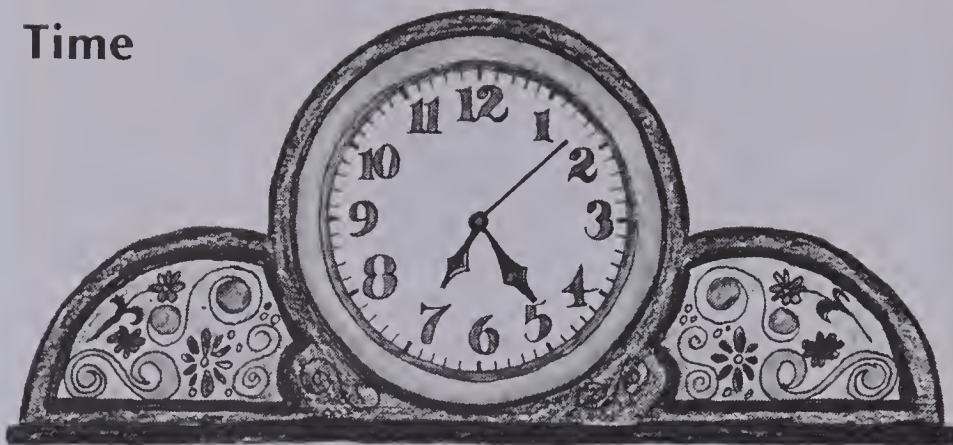
Point out that 60 minutes is one hour, and that we can count by fives around the clock.

Talk about the number of hours in a day.

Show the students a calendar and count the number of days in a week, of months in a year, and of weeks in a year.

Establish the relationship between seconds, minutes, hours, and days.

## Time



1 minute is 60 seconds.

1 hour is 60 minutes.

1 day is 24 hours.

1 week is 7 days.

1 year is 52 weeks.

1 year is 12 months.

### EXERCISES

Copy and complete.

1. There are ■ months in 1 year. **12**
2. There are ■ days in 1 week. **7**
3. There are ■ weeks in 1 year. **52**
4. There are ■ hours in 1 day. **24**
5. There are ■ minutes in 1 hour. **60**
6. There are ■ seconds in 1 minute. **60**
7. There are ■ days in 3 weeks. **21**
8. There are ■ hours in 2 days. **48**
9. There are ■ minutes in 2 hours. **120**
10. There are ■ seconds in 3 minutes. **180**
11. There are ■ months in 3 years. **36**

228

### Using the Exercises

- Students need a general understanding of the concept of time. Those having difficulty with questions 1, 2, 3, 7, and 11 should use a calendar.
- The remaining questions provide additional drill using the clock.

## PRACTICE

Copy and complete.

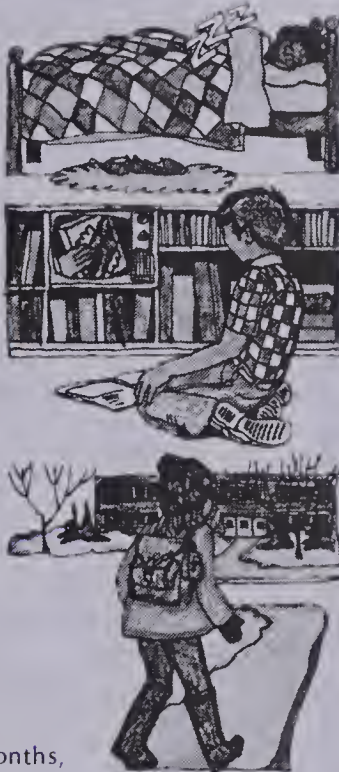
- 24 months is  $\blacksquare$  years. **2**
- There are  $\blacksquare$  seconds in 1 minute. **60**
- There are  $\blacksquare$  minutes in 2 hours. **120**
- 14 days is  $\blacksquare$  weeks. **2**
- $\blacksquare$  days is 3 weeks. **21**
- There are  $\blacksquare$  seconds in 1 hour. **3600**
- 180 minutes is  $\blacksquare$  hours. **3**
- 28 days is  $\blacksquare$  weeks. **4**

## Time for Problems

- Lou sleeps 8 hours a night. How many hours is he awake? **16 h**
- Baby Laura is 8 months old. How many months until the baby's next birthday? **4**
- The time is thirty-five minutes after three. How many minutes before four is it? **25**
- A TV commercial lasted a minute and a half. How many seconds is this? **90**
- Today is Tuesday the ninth. What is the date two weeks from now? **23rd**
- Dean watched TV for 55 min, then he read for 55 min. How long is this in hours and minutes? **1 h 50 min**
- School starts at 9:00 A.M. It takes Ida 20 min to walk to school. If she starts at 8:45 A.M., will she be on time? **No**
- List the summer months, fall months, winter months, and spring months.

Summer	Fall	Winter	Spring
June	September	December	March
July	October	January	April
August	November	February	May

229



## Assigning the Practice

Minimum: 1-8

Average: 1-8

Enriched: 1-8

## Reinforcement

1. Assign *Time for Problems* on page 229. Allow the use of calendars and clock faces if students are having difficulty.

2. Have the students make a list of the amount of time they spent doing things during the school day.

## Enrichment

1. Have the students read about time and calendars in an encyclopedia. How many kinds of clocks can they name? How did we get the names of the months of the year?

2. Some students might make a diary of what they do for one whole day. Record the amount of time used for each activity.

## Extra Practice

## Worksheet M19

Pages 228-229

Show the digital time on the clock face.

1.



3:45

2.



5:15

3.



9:05

4.



6:57

5.



10:38

6.



2:19

UNIT 10 LESSON 9

Objective M20

Tell time to the minute on the 24 hour clock.

Introducing the Lesson

Set the clock hands.  
Ask the class what time it is.  
Discuss the answer(s) using the a.m./p.m. concept. Use other clock settings (6:00, 9:00, etc.) and discuss them.

Teaching the Lesson

Give each student a ditto sheet of 4 blank clock faces. Draw a clock face on the board. Fill in the numbers 1 to 12 on the clock face. Ask the students to fill in one of the clocks on their sheet so that 13 falls on 1, 14 falls on 2, 15 falls on 3, until 24 falls on 12.



Position the hands on a 24 hour clock and ask what time the clock shows. Discuss the two possible answers (e.g., 2:00 and 14:00). Discuss how a person decides which is the correct time.

Have the students mark the numbers 13 to 24 on their clock faces inside the numbers 1 to 12. Have them draw in the hands to show the times: 17:00, 19:00, and 24:00. Discuss with the students that 0:00 to 12:00 is morning time, and 13:00 to 24:00 is afternoon and evening time. Note that 0:00 and 24:00 represent the same time. Both are acceptable representations of *midnight*.

The 24 Hour Clock



morning  
06:15

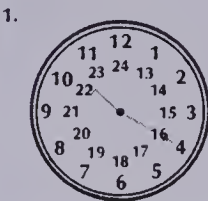


afternoon or evening  
18:15

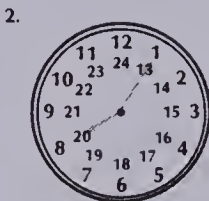
Use the **outer** circle of numbers. Use the **inner** circle of numbers.

EXERCISES

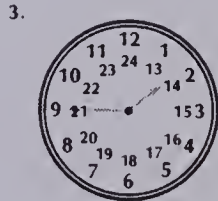
Write the time for each clock.



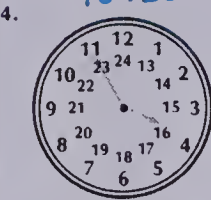
morning  
10:20



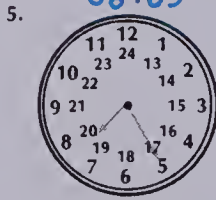
morning  
08:05



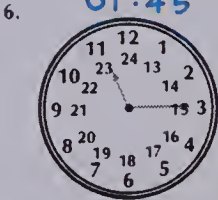
morning  
01:45



afternoon  
15:55



evening  
19:25



late evening  
23:15

Using the Exercises

- Questions 1 to 6 require an understanding of the 24 hour clock. Those having difficulty should list events that may take place during morning, afternoon, evening, late evening, and night. Have them assign specific times to each event.



## PRACTICE

Is it a morning time, an afternoon time, or an evening time?

- |                     |                     |                       |                       |                      |
|---------------------|---------------------|-----------------------|-----------------------|----------------------|
| 1. 07:00<br>morning | 2. 11:15<br>morning | 3. 14:10<br>afternoon | 4. 16:08<br>afternoon | 5. 21:00<br>evening  |
| 6. 06:32<br>morning | 7. 04:25<br>morning | 8. 18:05<br>evening   | 9. 24:00<br>morning   | 10. 19:50<br>evening |

Match.

- |                             |          |
|-----------------------------|----------|
| 11. Sunrise <b>C</b>        | A. 09:00 |
| 12. Get up <b>F</b>         | B. 12:00 |
| 13. Breakfast <b>D</b>      | C. 05:45 |
| 14. School starts <b>A</b>  | D. 08:00 |
| 15. Morning recess <b>I</b> | E. 18:00 |
| 16. Noon <b>B</b>           | F. 07:45 |
| 17. School ends <b>H</b>    | G. 20:30 |
| 18. Suppertime <b>E</b>     | H. 15:30 |
| 19. Bedtime <b>G</b>        | I. 10:15 |

Give the time on a 24 hour clock.

20. Pauline ate breakfast at 7 o'clock. **07:00**
21. Dorothy went to bed at 9 o'clock in the evening. **21:00**
22. Lunch was finished at 1 o'clock. **13:00**
23. Supper is at 7 o'clock. **19:00**

## Time Differences

Study the subtraction example carefully.

Then tell how long each job lasts.

- Ivan begins work at 10:20 and stops at 16:50.  
**6 h 30 min**
- Rita's work ends at 17:00. It starts at 08:30.  
**8 h 30 min**
- Paul works from 05:25 until 12:50.  
**7 h 25 min**
- Nan finishes at 06:30. She begins at 02:45.  
**3 h 45 min**

$$\begin{array}{r} 9\ 75 \\ 10:15 \\ - 03:30 \\ \hline 6\ h\ 45\ min \end{array}$$

231

## Assigning the Practice

Minimum: 1-19

Average: 1-21

Enriched: 6-23

## Reinforcement

Assign one or more of these problems.

- Make a Sunday Time Chart. List all the things you do regularly on a Sunday. Include getting up and going to bed and meals. After each item write the time you usually do it.
- Teddy had a nap from 11:00 to 13:00. How many hours did he sleep?
- Jerry's father went to bed at 22:00 and got up at 05:00 to go fishing. How many hours did he sleep?

## Enrichment

1. Assign *Time Differences* on page 231.

2. Ask the students to convert these times to the 12 hour system using a.m. and p.m.

- |          |          |          |
|----------|----------|----------|
| a. 07:25 | b. 10:35 | c. 17:05 |
| d. 23:10 | e. 11:20 | f. 21:20 |
| g. 13:03 | h. 03:01 | i. 12:56 |

## Extra Practice

Write the correct time.

- |   |   |   |   |
|---|---|---|---|
| 1. <br>morning<br><b>09:05</b> | 2. <br>afternoon<br><b>14:30</b> | 3. <br>evening<br><b>22:15</b> | 4. <br>morning<br><b>11:10</b> |
| 5. <br>night<br><b>23:25</b>   | 6. <br>afternoon<br><b>15:40</b> | 7. <br>morning<br><b>05:55</b> | 8. <br>evening<br><b>19:20</b> |

## Worksheet M20

Pages 230-231

# UNIT 10 LESSON 10

## Objective PS10

Recognize problems involving insufficient information.

## Introducing the Lesson

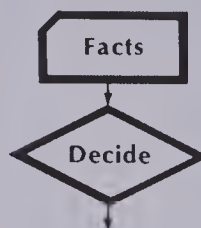
Review the steps in problem solving. Go through each step of the process to review the essential features. The **Facts** step involves locating the mathematical information. The **Decide** step involves choosing the operation. The **Arithmetic** step involves numerical calculation, and the **Answer** step involves stating the result.

## Teaching the Lesson

Refer to the problem stated in the textbook. After working through the situation, stress that completing the *Decide* step does not mean that a given problem can be solved. The *Decide* step determines the operation to use, **if** you have the necessary facts. It is the *Facts* step that will show whether or not there is enough information to solve the problem. Make sure that the pupils realize that it is necessary to have at least two numbers to carry out any of the four basic operations. In some cases, three or more numbers are needed. These ideas can be established by oral questions such as the following: "What do you need to know to find the perimeter of a field?" "What do you need to know to find the total amount of a bill?" And so on.

## Missing Information

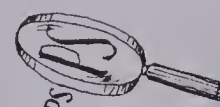
Mr. Kaszmarek is packing containers of strawberries on a shelf in the freezer. The shelf space is 6 containers long and 2 containers high. How many containers of strawberries can he fit in the space?



6 containers long  
2 containers high

To find how many will fit,  
multiply **length** × **width** × **height**

But we don't know the width.  
Information is **missing**.



Suppose the shelf space is 3 containers wide.  
Now, you can finish the problem

$$6 \times 3 \times 2 = 36 \text{ (containers)}$$

## EXERCISES

Some problems below do not have enough information.  
Supply a fact where needed and solve the problem.

1. A set of dishes has dinner plates, lunch plates, and dessert plates. What is the total number of plates?
2. A rectangular room has a side 4 m long. What is the area?
3. How much do three 2 L containers of milk cost?
4. What is the total cost of \$22 worth of strawberries and \$2 worth of sugar?
5. Jan shovelled 3 driveways. The first took 4 hours, the second 2 hours, and the third still less time. Find the average time it took her to shovel a driveway.

Answers  
vary.

3 × number of  
sets of dishes

4m × width of room

6 × cost of 1L  
or 3 × cost of 2L

\$24

$$\frac{4 + 2 + x}{3}$$

232

## Using the Exercises

- Students must have an understanding of the information needed to solve problems. Those having difficulty with questions 1 to 5 should try to illustrate each problem.

## PRACTICE

For each problem, supply a fact, then solve the problem.

1. A roll of sod will cover about one square metre of earth. Ms Peters wants to put new sod on her lawn which is 8 m long. How many rolls does she need?  $8 \times \text{width}$
2. The deep end of the Romanov's pool is 5 m wide and 7 m long. How many cubic metres of water does it contain?  $5 \times 7 \times \text{depth}$
3. Mr. Reagan is painting a bedroom. He has 3 cans of paint. The paint in each can will cover about  $26 \text{ m}^2$ . Does he have enough paint?  $\text{area} \div 26 \times 3$
4. Jon is going to make the beds. The ratio of sheets to beds is 2 to 1. How many sheets does Jon need?  $2 \times \text{number of beds}$

## REVIEW

- A55 What is the average?  
1. Years: 3, 6, and 9 **6** 2. Cents: 10, 14, 15, and 21 **15**
- A56 The cost of sandwiches is 70¢ per sandwich.  
3. How much would 3 sandwiches cost? **\$2.10**  
4. How much would 8 sandwiches cost? **\$5.60**
- M18 The scale on a map is 1 cm = 10 km.  
5. How many kilometres do 3 cm on the map represent? **30 km**  
6. How many kilometres do 6 cm on the map represent? **60 km**
- M19  
7. How many days are there in 2 weeks? **14**  
8. How many weeks are there in a year? **52**  
9. How many hours is it from 11:00 P.M. to 2:00 A.M.? **3**
- M20  
10. What time would school be over, **15:30** or 18:30?  
11. What time would most children go to bed, 17:30 or **20:30**?

233

## Assigning the Practice

Minimum: 1-4

Average: 1-4

Enriched: 1-4

## Review Exercises

Questions	Objective	Pages
1-2	A55	222-223
3-4	A56	224-225
5-6	M18	226-227
7-9	M19	228-229
10-11	M20	230-231

## Reinforcement

1. Ask the pupils to make up their own problems like the ones in the Practice.

2. Ask each pupil to create his or her own missing information problem. Assemble these in a review exercise for class work.

## Enrichment

Discuss everyday situations in which information is missing, for example: going shopping with an incomplete shopping list, or buying clothes for someone without knowing his or her measurements.

## Extra Practice

## Worksheet PS10

Pages 232-233

Some of these problems do not have enough information. For each, supply a fact, then solve the problem.

1. How much soil has to be dug out to make a hole that is 5 m wide and 5 m long?  $5 \times 5 \times \text{depth}$
2. A rectangular floor is 8 m long. What is its area?  $8 \times \text{width}$
3. Chan bought a fish tank for \$10, tropical fish for \$3, and shells and ferns for \$2. What was his total bill? **\$15**
4. School starts at 9:00. Ralph left home at 8:35. Was he late?

**How long does it take to get to school?**

## Problem Solving Activities

Assign Level 4, Units 9 and 10



Unit 10 Objective	Test Questions	Pages
M14	1-3	214-215
M15	4-6	216-217
M16	7	218-219
M17	8, 9	220-221
A55	10, 11	222-223
A56	12, 13	224-225
M18	14-16	226-227
M19	17, 18	228-229
M20	19	230-231

# TEST

# UNIT 10

What is the area of each surface?

1.



4

2.



10

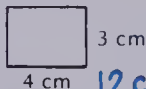
3.



9

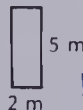
What is the area in square centimetres or square metres?

4.



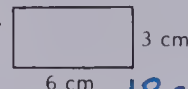
12 cm<sup>2</sup>

5.



10 m<sup>2</sup>

6.



18 cm<sup>2</sup>

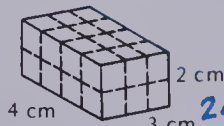
What is the volume?

7.



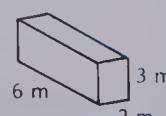
8

8.



24 cm<sup>3</sup>

9.



36 m<sup>3</sup>

What is the average?

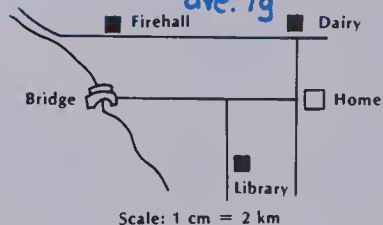
$$\begin{array}{r} 3 \text{ min} \\ 5 \text{ min} \\ + 10 \text{ min} \\ \hline \text{ave. } 6 \text{ min} \end{array}$$

$$\begin{array}{r} 4 \text{ g} \\ 6 \text{ g} \\ 8 \text{ g} \\ + 10 \text{ g} \\ \hline \text{ave. } 7 \text{ g} \end{array}$$

Copy and complete.

12. The ratio of arms to noses is 2 to 1.

13. The ratio of hours to days is 24 to 1.



14. How far is it from the dairy to home? 2 km

15. How far is it from the firehall to the dairy? 6 km

16. How far is it from the bridge to the library? (Follow the road.) 6 km

Solve.

17. How many minutes are there in an hour? 60 min

18. How many days are there in 4 weeks? 28 d

19. Hank goes to bed at 9 o'clock. What time is this on the 24 hour clock? 21:00

## Post-test

## Unit 10

What is the area?

1.



4

2.



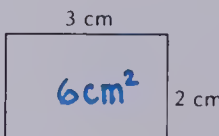
6

3.



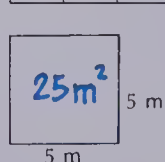
6

4.



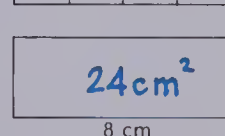
6 cm<sup>2</sup>

5.



25 m<sup>2</sup>

6.



24 cm<sup>2</sup>

What is the volume?

7.



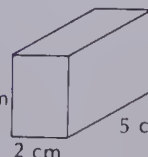
6

8.



18 cm<sup>3</sup>

9.



30 cm<sup>3</sup>

What is the average?

10. 6, 4, 8 6

11. 3, 9, 10, 3, 5 6

# DIVISION

Divide.

1.  $4 \overline{)24}$  6
2.  $7 \overline{)42}$  6
3.  $5 \overline{)35}$  7
4.  $9 \overline{)72}$  8
5.  $8 \overline{)64}$  8
6.  $4 \overline{)9}$  2 R1
7.  $8 \overline{)66}$  8 R2
8.  $5 \overline{)8}$  1 R3
9.  $6 \overline{)38}$  6 R2
10.  $3 \overline{)25}$  8 R1
11.  $3 \overline{)30}$  10
12.  $6 \overline{)540}$  90
13.  $4 \overline{)80}$  20
14.  $9 \overline{)810}$  90
15.  $5 \overline{)150}$  30
16.  $2 \overline{)64}$  32
17.  $3 \overline{)93}$  31
18.  $4 \overline{)48}$  12
19.  $5 \overline{)50}$  10
20.  $8 \overline{)88}$  11
21.  $2 \overline{)56}$  28
22.  $3 \overline{)72}$  24
23.  $4 \overline{)64}$  16
24.  $5 \overline{)75}$  25
25.  $6 \overline{)78}$  13
26.  $3 \overline{)67}$  22 R1
27.  $7 \overline{)85}$  12 R1
28.  $4 \overline{)51}$  12 R3
29.  $5 \overline{)72}$  14 R2
30.  $8 \overline{)98}$  12 R2
31.  $5 \overline{)255}$  51
32.  $6 \overline{)426}$  71
33.  $4 \overline{)288}$  72
34.  $7 \overline{)427}$  61
35.  $2 \overline{)126}$  63
36.  $3 \overline{)165}$  55
37.  $8 \overline{)672}$  84
38.  $9 \overline{)846}$  94
39.  $5 \overline{)375}$  75
40.  $4 \overline{)192}$  48
41.  $7 \overline{)444}$  63 R3
42.  $2 \overline{)113}$  56 R1
43.  $9 \overline{)479}$  53 R2
44.  $3 \overline{)170}$  56 R2
45.  $4 \overline{)311}$  77 R3

Solve.

46. Best Bakery is open 6 days a week. In one week they are open 72 hours. They are open the same number of hours each day. How many hours are they open each day? 12 h
47. A bakery sold 8 wedding cakes of the same size for \$648. How much did each wedding cake cost? \$81
48. The Cookie Shop uses 570 g of raisins in 6 batches of cookies. How many grams of raisins should be in each batch? 95 g

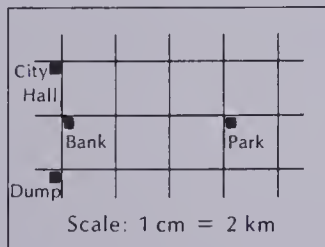
235

Complete each ratio.

12. days to weeks: 7 to 1
13. months to years: 12 to 1

Write each distance.

14. City Hall to Bank: 2 km
15. Bank to Park: 6 km
16. Park to Dump by road: 8 km



Complete.

17. one day = 24 hours
18. 2 hours = 120 minutes
19. 6 P.M. = 18:00

# UNIT 11

## Multiplication and Division

Theme: Field Day and Picnic

Lesson		Objective	Pages
Preview		Review multiplication and division in problem situations.	237
1	A57	Multiply a two-digit number by a two-digit multiple of 10.	238-239
2	A58	Multiply 2 two-digit numbers.	240-241
3	A59	Multiply a three-digit number by a two-digit multiple of 10.	242-243
4	A60	Multiply a three-digit number by a two-digit number.	244-245
5	A61	Divide a three-digit dividend by a one-digit divisor with no remainder. (Each digit of the dividend is a multiple of the divisor.)	246-247
6	A62	Divide a three-digit dividend by a one-digit divisor with no remainder. (The second digit of the dividend is not a multiple of the divisor.)	248-249
7	A63	Divide a three-digit dividend by a one-digit divisor with no remainder. (The first two digits of the dividend are not multiples of the divisor.)	250-251
8	A64	Divide a three-digit number by a one-digit divisor with a remainder.	252-253
9	A65	Divide a three-digit dividend by a one-digit divisor when there is a zero in the quotient.	254-255
10	PS11	Solve problems involving extraneous information.	256-257
Test		Multiplication and Division	258
Review		Measurement	259



# About This Unit

The instructional strategy is to develop a cluster of related skills, step by step, in order to establish the algorithm. Each lesson is built on a lesson example that demonstrates a particular rule and shows how that rule can be used to solve practical problems. The exercises are set up sequentially to aid the learning of the skill.

Whenever possible, use concrete materials, such as wooden blocks (for hundreds, tens, and ones) and bundles of sticks to illustrate the problem situation of the lesson. It is important for the students to understand and learn the algorithm.

This unit picks up where Units 8 and 9 left off. This will be the students' first experience with two-digit multipliers and with three-digit quotients.

For the multiplication section, it is important that students have mastered the short form of multiplication introduced in Unit 8. If Unit 8 was done mostly or completely using the long form, some extra teaching and practice will be required before beginning this unit. Two-digit multiplication becomes very cumbersome if the long form is used.

Compare:

635	with	635
$\times 38$		$\times 38$
<hr/>		<hr/>
40		5 080
240		19 050
4 800		<hr/>
150		24 130
900		
<hr/>		
18 000		
24 130		

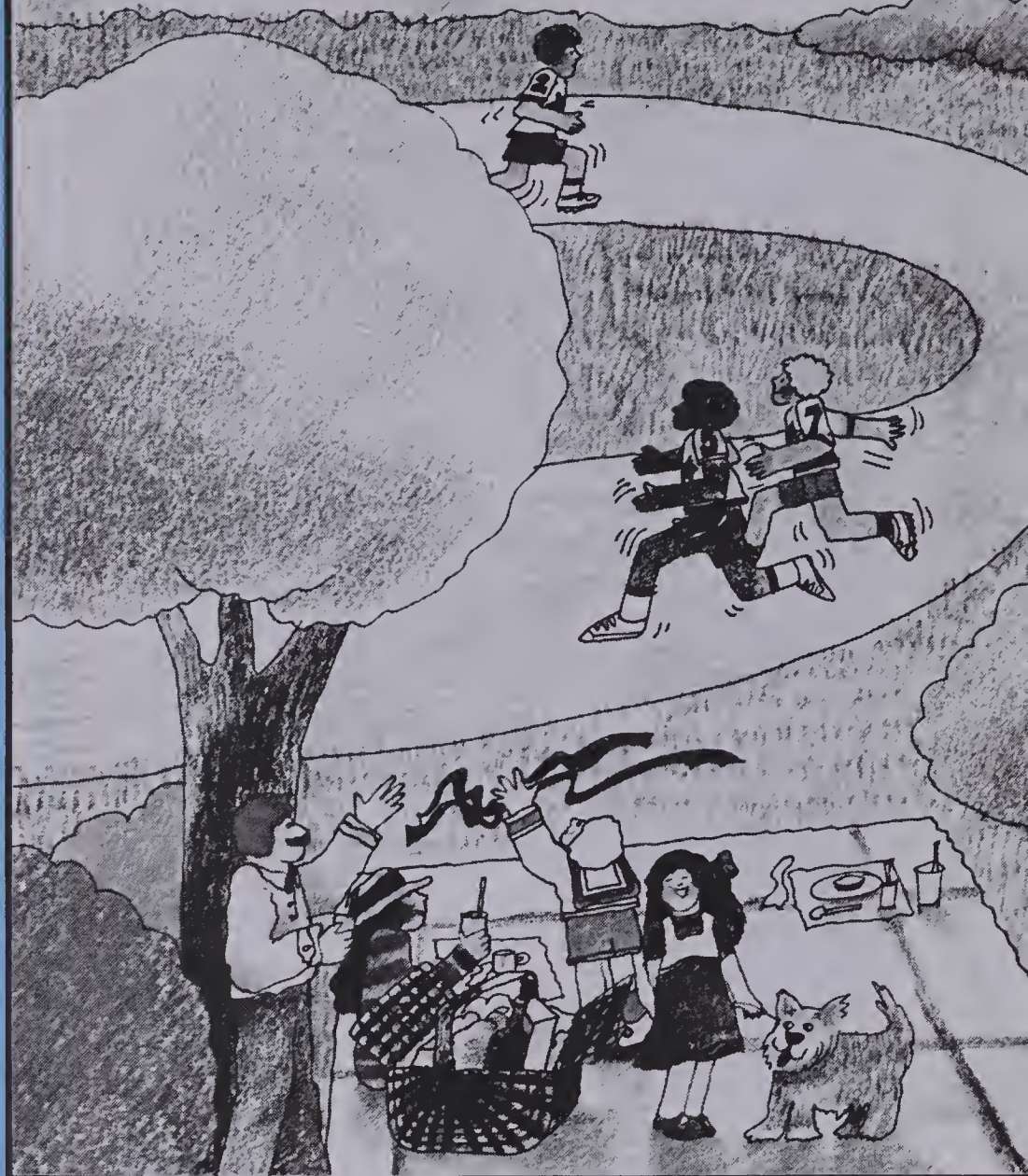
In division, some students have difficulties with examples involving a three-digit quotient with a zero in the tens place. Therefore, a special lesson is devoted to this skill. Such examples do not occur before Lesson 9.

## Ideas

A prearranged visit with the vice-principal, the custodian, and a grocery store manager may be useful. See the suggestions for Enrichment activities in this unit.

# UNIT 11

## MULTIPLICATION & DIVISION



Unit 11 Objective	Test Questions	Pages
A57	1-5	238-239
A58	6-10	240-241
A59	11-15	242-243
A60	16-20	244-245
A61	21-25	246-247
A62	26-30	248-249
A63	31-35	250-251
A64	36-40	252-253
A65	41-45	254-255
PS	46	

### Pretest

Multiply.

$$\begin{array}{r} 1. \quad 32 \\ \times 20 \\ \hline 640 \end{array}$$

$$\begin{array}{r} 2. \quad 21 \\ \times 50 \\ \hline 1050 \end{array}$$

$$\begin{array}{r} 3. \quad 16 \\ \times 80 \\ \hline 1280 \end{array}$$

$$\begin{array}{r} 4. \quad 64 \\ \times 70 \\ \hline 4480 \end{array}$$

$$\begin{array}{r} 5. \quad 26 \\ \times 30 \\ \hline 780 \end{array}$$

$$\begin{array}{r} 6. \quad 21 \\ \times 48 \\ \hline 1008 \end{array}$$

$$\begin{array}{r} 7. \quad 23 \\ \times 19 \\ \hline 437 \end{array}$$

$$\begin{array}{r} 8. \quad 18 \\ \times 84 \\ \hline 1512 \end{array}$$

$$\begin{array}{r} 9. \quad 63 \\ \times 91 \\ \hline 5733 \end{array}$$

$$\begin{array}{r} 10. \quad 76 \\ \times 58 \\ \hline 4408 \end{array}$$

$$\begin{array}{r} 11. \quad 265 \\ \times 10 \\ \hline 2650 \end{array}$$

$$\begin{array}{r} 12. \quad 312 \\ \times 30 \\ \hline 9360 \end{array}$$

$$\begin{array}{r} 13. \quad 433 \\ \times 50 \\ \hline 21650 \end{array}$$

$$\begin{array}{r} 14. \quad 174 \\ \times 80 \\ \hline 13920 \end{array}$$

$$\begin{array}{r} 15. \quad 165 \\ \times 40 \\ \hline 6600 \end{array}$$

$$\begin{array}{r} 16. \quad 218 \\ \times 12 \\ \hline 2616 \end{array}$$

$$\begin{array}{r} 17. \quad 312 \\ \times 64 \\ \hline 19968 \end{array}$$

$$\begin{array}{r} 18. \quad 654 \\ \times 23 \\ \hline 15042 \end{array}$$

$$\begin{array}{r} 19. \quad 502 \\ \times 48 \\ \hline 24096 \end{array}$$

$$\begin{array}{r} 20. \quad 115 \\ \times 96 \\ \hline 11040 \end{array}$$

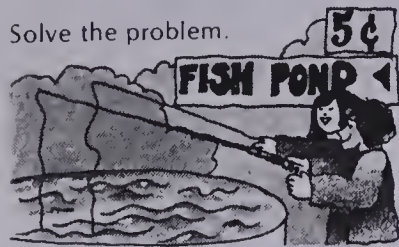
### Unit 11



## Picnic

Read the information and the multiplication or division question.  
What question is being asked in each problem?

Solve the problem.



120 children fishing  
5¢ each

$$\begin{array}{r} 120 \\ \times 5 \\ \hline \$6.00 \end{array}$$


8 laps  
125 m each

$$\begin{array}{r} 125 \\ \times 8 \\ \hline 1000 \text{ m} \end{array}$$

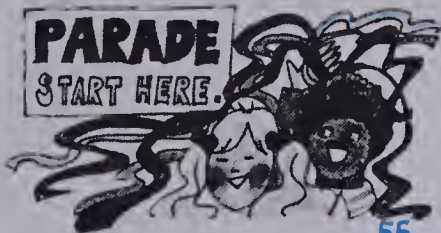

112 g each  
Lou ate 3.

$$\begin{array}{r} 112 \\ \times 3 \\ \hline 336 \text{ g} \end{array}$$


**TRIPLE-SCOOP  
DELUXE!**

186 scoops of ice cream  
3 scoops for each cone

$$\begin{array}{r} 62 \\ 3 \overline{)186} \end{array}$$
 62 cones



275 m of crepe paper  
5 m to each

$$\begin{array}{r} 55 \\ 5 \overline{)275} \end{array}$$
 55 rolls of  
crepe paper



252 m relay  
3 runners

$$\begin{array}{r} 84 \\ 3 \overline{)252} \end{array}$$
 84 m  
each runner

## UNIT 11 PREVIEW

### Suggestions

If a review of the short form of multiplication is indicated, demonstrate the solutions to the first three problems and assign the Practice. Assign *Looking Back* on page 211 or review exercises 1 to 35 on page 340.

### About the Page

The page represents multiplication and division problem situations. Have the students tell what question is being asked. That is, what information does the indicated calculation give?

Students should calculate the first three problems using the short form of multiplication, but short division is not required in the last three problems. If students have difficulty with these calculations, then some additional teaching and practice is required before proceeding with this unit.

### Reinforcement

Students can make up and solve other problems based on these pictures and on the picture on the title page.

Divide.

21. 
$$\begin{array}{r} 132 \\ 2 \overline{)264} \end{array}$$
 22. 
$$\begin{array}{r} 213 \\ 3 \overline{)639} \end{array}$$
 23. 
$$\begin{array}{r} 212 \\ 4 \overline{)848} \end{array}$$
 24. 
$$\begin{array}{r} 111 \\ 6 \overline{)666} \end{array}$$
 25. 
$$\begin{array}{r} 110 \\ 5 \overline{)550} \end{array}$$

26. 
$$\begin{array}{r} 318 \\ 2 \overline{)636} \end{array}$$
 27. 
$$\begin{array}{r} 228 \\ 3 \overline{)684} \end{array}$$
 28. 
$$\begin{array}{r} 436 \\ 2 \overline{)872} \end{array}$$
 29. 
$$\begin{array}{r} 119 \\ 4 \overline{)476} \end{array}$$
 30. 
$$\begin{array}{r} 116 \\ 6 \overline{)696} \end{array}$$

31. 
$$\begin{array}{r} 263 \\ 2 \overline{)526} \end{array}$$
 32. 
$$\begin{array}{r} 161 \\ 4 \overline{)644} \end{array}$$
 33. 
$$\begin{array}{r} 122 \\ 7 \overline{)854} \end{array}$$
 34. 
$$\begin{array}{r} 145 \\ 5 \overline{)725} \end{array}$$
 35. 
$$\begin{array}{r} 177 \\ 3 \overline{)531} \end{array}$$

36. 
$$\begin{array}{r} 231 \text{ R } 2 \\ 3 \overline{)695} \end{array}$$
 37. 
$$\begin{array}{r} 151 \text{ R } 2 \\ 5 \overline{)757} \end{array}$$
 38. 
$$\begin{array}{r} 122 \text{ R } 6 \\ 8 \overline{)982} \end{array}$$
 39. 
$$\begin{array}{r} 162 \text{ R } 3 \\ 4 \overline{)651} \end{array}$$
 40. 
$$\begin{array}{r} 455 \text{ R } 1 \\ 2 \overline{)911} \end{array}$$

41. 
$$\begin{array}{r} 302 \\ 2 \overline{)604} \end{array}$$
 42. 
$$\begin{array}{r} 101 \text{ R } 3 \\ 6 \overline{)609} \end{array}$$
 43. 
$$\begin{array}{r} 108 \\ 9 \overline{)972} \end{array}$$
 44. 
$$\begin{array}{r} 108 \text{ R } 2 \\ 8 \overline{)866} \end{array}$$
 45. 
$$\begin{array}{r} 207 \text{ R } 2 \\ 3 \overline{)623} \end{array}$$



# UNIT 11 LESSON 1

## Objective A57

Multiply a two-digit number by a two-digit multiple of 10.

## Introducing the Lesson

Discuss everyday situations in which people might do this kind of multiplication; for example: changing dollars for dimes, buying screws and nails in packages of 10, buying candies, counting groups of people, computing distances, and counting packaged items.

## Teaching the Lesson

Begin the lesson by reviewing how to multiply a two-digit number by a one-digit number. Use an example leading up to the example in the lesson.

$$\begin{array}{r} 16 \\ \times 4 \\ \hline \end{array} \longrightarrow \begin{array}{r} 2 \\ 16 \\ \times 4 \\ \hline 64 \end{array}$$

It is especially important to use the short form as developed in the teacher's notes for Unit 8. If Unit 8 was done mostly with the long form, refer to the introduction to this unit, and also to the Suggestions section on page 237.

Note that multiplying by a multiple of ten is a special case. The product is given in one row instead of two. Call attention to the placement of the answer for  $4 \text{ tens} \times 16$ .  $4 \text{ tens} \times 16$  is 640, but a zero is already in the ones place and should not be repeated. If students have difficulty seeing this, use the long form to demonstrate.

$$\begin{array}{r} 16 \\ \times 40 \\ \hline 240 \leftarrow 40 \times 6 \\ 400 \leftarrow 40 \times 10 \\ \hline 640 \end{array}$$

## Multiples of Ten

Burlington is having a field day and picnic. The organizers want pennants to be given out to the spectators. They ordered 40 boxes of 16 pennants each. How many pennants will there be?

Write the question.

Multiply  $0 \times 16$ .

Multiply  $4 \text{ tens} \times 16$ .

$$\begin{array}{r} 16 \\ \times 40 \\ \hline 0 \end{array}$$

$$\begin{array}{r} 16 \\ \times 40 \\ \hline 0 \end{array}$$

$$\begin{array}{r} 16 \\ \times 40 \\ \hline 640 \end{array}$$

$$\begin{array}{r} 16 \\ \times 40 \\ \hline 640 \end{array}$$

There will be 640 pennants to give out.



## EXERCISES

Multiply.

- |   |   |   |   |   |
|---|---|---|---|---|
| 1. $\begin{array}{r} 14 \\ \times 2 \\ \hline 28 \end{array}$     | 2. $\begin{array}{r} 14 \\ \times 20 \\ \hline 280 \end{array}$   | 3. $\begin{array}{r} 42 \\ \times 3 \\ \hline 126 \end{array}$    | 4. $\begin{array}{r} 42 \\ \times 30 \\ \hline 1260 \end{array}$  | 5. $\begin{array}{r} 61 \\ \times 4 \\ \hline 244 \end{array}$    |
| 6. $\begin{array}{r} 61 \\ \times 40 \\ \hline 2440 \end{array}$  | 7. $\begin{array}{r} 35 \\ \times 3 \\ \hline 105 \end{array}$    | 8. $\begin{array}{r} 35 \\ \times 30 \\ \hline 1050 \end{array}$  | 9. $\begin{array}{r} 27 \\ \times 4 \\ \hline 108 \end{array}$    | 10. $\begin{array}{r} 27 \\ \times 40 \\ \hline 1080 \end{array}$ |
| 11. $\begin{array}{r} 32 \\ \times 20 \\ \hline 640 \end{array}$  | 12. $\begin{array}{r} 71 \\ \times 60 \\ \hline 4260 \end{array}$ | 13. $\begin{array}{r} 83 \\ \times 30 \\ \hline 2490 \end{array}$ | 14. $\begin{array}{r} 92 \\ \times 40 \\ \hline 3680 \end{array}$ | 15. $\begin{array}{r} 54 \\ \times 20 \\ \hline 1080 \end{array}$ |
| 16. $\begin{array}{r} 55 \\ \times 30 \\ \hline 1650 \end{array}$ | 17. $\begin{array}{r} 26 \\ \times 60 \\ \hline 1560 \end{array}$ | 18. $\begin{array}{r} 38 \\ \times 50 \\ \hline 1900 \end{array}$ | 19. $\begin{array}{r} 47 \\ \times 40 \\ \hline 1880 \end{array}$ | 20. $\begin{array}{r} 68 \\ \times 70 \\ \hline 4760 \end{array}$ |

238

## Using the Exercises

- Exercises 1 to 10 lead the students to multiplication by tens ( $20 \times 14$ ) by first multiplying the same number in the ones place ( $2 \times 14$ ). This step reviews the multiplication facts involved and is a simpler situation. The placement of the zero in the product can be concentrated on in the second exercise of each pair.
- Exercises 11 to 20 are mixed practice. Students who have difficulty with exercises 16 to 20 need to practise one-digit multiplication involving carrying.

## PRACTICE

Multiply.

- |   |   |   |   |   |
|---|---|---|---|---|
| 1. $\begin{array}{r} 12 \\ \times 40 \\ \hline 480 \end{array}$   | 2. $\begin{array}{r} 41 \\ \times 20 \\ \hline 820 \end{array}$   | 3. $\begin{array}{r} 32 \\ \times 30 \\ \hline 960 \end{array}$   | 4. $\begin{array}{r} 43 \\ \times 20 \\ \hline 860 \end{array}$   | 5. $\begin{array}{r} 76 \\ \times 10 \\ \hline 760 \end{array}$   |
| 6. $\begin{array}{r} 11 \\ \times 60 \\ \hline 660 \end{array}$   | 7. $\begin{array}{r} 52 \\ \times 20 \\ \hline 1040 \end{array}$  | 8. $\begin{array}{r} 43 \\ \times 30 \\ \hline 1290 \end{array}$  | 9. $\begin{array}{r} 61 \\ \times 50 \\ \hline 3050 \end{array}$  | 10. $\begin{array}{r} 32 \\ \times 40 \\ \hline 1280 \end{array}$ |
| 11. $\begin{array}{r} 16 \\ \times 20 \\ \hline 320 \end{array}$  | 12. $\begin{array}{r} 27 \\ \times 30 \\ \hline 810 \end{array}$  | 13. $\begin{array}{r} 35 \\ \times 40 \\ \hline 1400 \end{array}$ | 14. $\begin{array}{r} 43 \\ \times 50 \\ \hline 2150 \end{array}$ | 15. $\begin{array}{r} 50 \\ \times 30 \\ \hline 1500 \end{array}$ |
| 16. $\begin{array}{r} 47 \\ \times 60 \\ \hline 2820 \end{array}$ | 17. $\begin{array}{r} 68 \\ \times 70 \\ \hline 4760 \end{array}$ | 18. $\begin{array}{r} 75 \\ \times 80 \\ \hline 6000 \end{array}$ | 19. $\begin{array}{r} 59 \\ \times 70 \\ \hline 4130 \end{array}$ | 20. $\begin{array}{r} 87 \\ \times 90 \\ \hline 7830 \end{array}$ |

Solve.

- Some people are making old-fashioned costumes for the event. Leon's Fabric Store ordered 20 bolts of cloth they could use. There are 25 m of cloth on each bolt. How many metres of cloth were ordered? **500 m**
- In the morning, there will be a parade. The organizers will give out 80 rolls of crepe paper to decorate bikes. Each roll has 12 m of crepe paper. How many metres of crepe paper will be given out? **960 m**
- The grandstand for viewing the events has a section with 15 rows, 20 seats in a row. How many people will that section seat? **300 people**

## Consumer Problem

One litre of ice cream serves 4 people. How many people can be served from 20 four-litre containers?

**320 people**



239

## Assigning the Practice

Minimum: 1-15, 21

Average: 6-22

Enriched: 11-23

## Reinforcement

1. The *Consumer Problem* on page 239 can be assigned to all students. It is a straightforward application of repeated multiplication.

2. Remove the face cards from a deck of cards. From the cards left, give each player one red card and two black cards. Use the numeral on the red card to make a multiple of 10. Use the numerals on the black cards to make a two-digit number. Multiply.



Ask the students to exchange cards to check answers.

## Enrichment

Have the students record at least 5 items, each of which come in a large container or box at the grocery store. If possible, visit a store and talk to the manager.

Example: Cans of peas are 24 to a box, large bottles of pop are 12 to a case. Then students can make up problems regarding the purchase of 10, 20, or 30 boxes.

## Extra Practice

## Worksheet A57

Pages 238-239

Multiply.

- |   |   |   |   |   |
|---|---|---|---|---|
| 1. $\begin{array}{r} 23 \\ \times 20 \\ \hline 460 \end{array}$   | 2. $\begin{array}{r} 31 \\ \times 30 \\ \hline 930 \end{array}$   | 3. $\begin{array}{r} 42 \\ \times 10 \\ \hline 420 \end{array}$   | 4. $\begin{array}{r} 62 \\ \times 30 \\ \hline 1860 \end{array}$  | 5. $\begin{array}{r} 91 \\ \times 40 \\ \hline 3640 \end{array}$  |
| 6. $\begin{array}{r} 70 \\ \times 40 \\ \hline 2800 \end{array}$  | 7. $\begin{array}{r} 64 \\ \times 20 \\ \hline 1280 \end{array}$  | 8. $\begin{array}{r} 58 \\ \times 60 \\ \hline 3480 \end{array}$  | 9. $\begin{array}{r} 96 \\ \times 80 \\ \hline 7680 \end{array}$  | 10. $\begin{array}{r} 87 \\ \times 70 \\ \hline 6090 \end{array}$ |
| 11. $\begin{array}{r} 16 \\ \times 90 \\ \hline 1440 \end{array}$ | 12. $\begin{array}{r} 35 \\ \times 40 \\ \hline 1400 \end{array}$ | 13. $\begin{array}{r} 82 \\ \times 50 \\ \hline 4100 \end{array}$ | 14. $\begin{array}{r} 23 \\ \times 70 \\ \hline 1610 \end{array}$ | 15. $\begin{array}{r} 85 \\ \times 20 \\ \hline 1700 \end{array}$ |

Solve.

- Brian won the skipping contest by skipping 60 times per minute. He kept this pace for 12 minutes. How many times did he skip altogether?

**720 times**

# UNIT 11 LESSON 2

## Objective A58

Multiply 2 two-digit numbers.

## Introducing the Lesson

Ask students to invent everyday situations in which people need to be able to multiply a two-digit number by a two-digit number. Many of these problems will involve counting, finding costs, or finding measurements.

## Teaching the Lesson

Review multiplication of a two-digit number by a one-digit number, and of a two-digit number by a multiple of ten. This can be done by using different versions of the lesson example.

$$\begin{array}{r} 2 \\ 36 \\ \times 4 \\ \hline 144 \end{array} \quad \begin{array}{r} 1 \\ 36 \\ \times 20 \\ \hline 720 \end{array}$$

Then take up the lesson example at the chalkboard. Be sure to emphasize the two stages: multiplication by the ones digit and multiplication by the tens digit. Discuss why the zero occurs in the second stage; that is, in multiplying by 2 tens, one is really multiplying by 20, not by 2.

# Multiplying with Two Digits



The teenagers are having a lemonade stand at the Burlington picnic. They bought enough lemons to make 24 batches of lemonade. Each batch makes 36 cups. How many cups of lemonade do they plan to sell?

Write the question.

Multiply  
 $4 \times 36$

Multiply  
 $2 \text{ tens} \times 36$  Add.

$$\begin{array}{r} 36 \\ \times 24 \\ \hline 144 \\ 720 \\ \hline 864 \end{array}$$

They plan to sell 864 cups of lemonade.

## EXERCISES

Multiply.

- |   |   |   |   |   |
|---|---|---|---|---|
| 1. $\begin{array}{r} 32 \\ \times 2 \\ \hline 64 \end{array}$     | 2. $\begin{array}{r} 32 \\ \times 10 \\ \hline 320 \end{array}$   | 3. $\begin{array}{r} 32 \\ \times 12 \\ \hline 384 \end{array}$   | 4. $\begin{array}{r} 21 \\ \times 2 \\ \hline 42 \end{array}$     | 5. $\begin{array}{r} 21 \\ \times 40 \\ \hline 840 \end{array}$   |
| 6. $\begin{array}{r} 21 \\ \times 42 \\ \hline 882 \end{array}$   | 7. $\begin{array}{r} 42 \\ \times 3 \\ \hline 126 \end{array}$    | 8. $\begin{array}{r} 42 \\ \times 50 \\ \hline 2100 \end{array}$  | 9. $\begin{array}{r} 42 \\ \times 53 \\ \hline 2226 \end{array}$  | 10. $\begin{array}{r} 37 \\ \times 3 \\ \hline 111 \end{array}$   |
| 11. $\begin{array}{r} 37 \\ \times 10 \\ \hline 370 \end{array}$  | 12. $\begin{array}{r} 37 \\ \times 13 \\ \hline 481 \end{array}$  | 13. $\begin{array}{r} 86 \\ \times 4 \\ \hline 344 \end{array}$   | 14. $\begin{array}{r} 86 \\ \times 50 \\ \hline 4300 \end{array}$ | 15. $\begin{array}{r} 86 \\ \times 54 \\ \hline 4644 \end{array}$ |
| 16. $\begin{array}{r} 28 \\ \times 45 \\ \hline 1260 \end{array}$ | 17. $\begin{array}{r} 36 \\ \times 61 \\ \hline 2196 \end{array}$ | 18. $\begin{array}{r} 92 \\ \times 18 \\ \hline 1656 \end{array}$ | 19. $\begin{array}{r} 45 \\ \times 25 \\ \hline 1125 \end{array}$ | 20. $\begin{array}{r} 74 \\ \times 38 \\ \hline 2812 \end{array}$ |

240

## Using the Exercises

- Exercises 1 to 15 are structured so that each problem is first broken up into the two stages:

$$\begin{array}{r} 32 \\ \times 2 \\ \hline \end{array} \quad \begin{array}{r} 32 \\ \times 10 \\ \hline \end{array} \quad \begin{array}{r} 32 \\ \times 12 \\ \hline \end{array}$$

- Exercises 1 to 6 involve no carrying.
- Exercises 16 to 20 are mixed practice.



## PRACTICE

Multiply.

- |   |   |   |   |   |
|---|---|---|---|---|
| 1. $\begin{array}{r} 14 \\ \times 21 \\ \hline 294 \end{array}$   | 2. $\begin{array}{r} 23 \\ \times 33 \\ \hline 759 \end{array}$   | 3. $\begin{array}{r} 61 \\ \times 11 \\ \hline 671 \end{array}$   | 4. $\begin{array}{r} 42 \\ \times 20 \\ \hline 840 \end{array}$   | 5. $\begin{array}{r} 20 \\ \times 32 \\ \hline 640 \end{array}$   |
| 6. $\begin{array}{r} 41 \\ \times 32 \\ \hline 1312 \end{array}$  | 7. $\begin{array}{r} 62 \\ \times 24 \\ \hline 1488 \end{array}$  | 8. $\begin{array}{r} 52 \\ \times 43 \\ \hline 2236 \end{array}$  | 9. $\begin{array}{r} 32 \\ \times 32 \\ \hline 1024 \end{array}$  | 10. $\begin{array}{r} 70 \\ \times 45 \\ \hline 3150 \end{array}$ |
| 11. $\begin{array}{r} 25 \\ \times 32 \\ \hline 800 \end{array}$  | 12. $\begin{array}{r} 36 \\ \times 24 \\ \hline 864 \end{array}$  | 13. $\begin{array}{r} 18 \\ \times 36 \\ \hline 648 \end{array}$  | 14. $\begin{array}{r} 29 \\ \times 38 \\ \hline 1102 \end{array}$ | 15. $\begin{array}{r} 45 \\ \times 27 \\ \hline 1215 \end{array}$ |
| 16. $\begin{array}{r} 58 \\ \times 67 \\ \hline 3886 \end{array}$ | 17. $\begin{array}{r} 74 \\ \times 84 \\ \hline 6216 \end{array}$ | 18. $\begin{array}{r} 49 \\ \times 93 \\ \hline 4557 \end{array}$ | 19. $\begin{array}{r} 97 \\ \times 75 \\ \hline 7275 \end{array}$ | 20. $\begin{array}{r} 78 \\ \times 68 \\ \hline 5304 \end{array}$ |

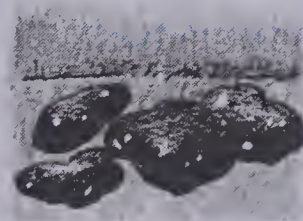
Solve.

- Swimming races were held in a pool which is 18 m long. In one race the contestants swam 24 lengths of the pool. How far did each contestant swim? Is this more or less than a kilometre? **432 m; less**
- There were 36 cups in each batch of lemonade. It was sold for 25¢ a cup. How much money was taken in for each batch of lemonade? **\$9.00**
- In Problem 22, 4 cups of lemonade cost \$1.00. How does this fact make the problem easier to solve?  **$\frac{9}{4} = \$9$**

## Hot Potato!

The course for the potato race is 25 m long. Each player must run to the goal, scoop up a potato, and bring it back to the start. The first player to bring back 12 potatoes wins. How far does the winning player run?

**600 m**



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## Assigning the Practice

Minimum: 1-15, 21

Average: 6-22

Enriched: 11-23

## Reinforcement

- The challenge *Hot Potato!* on page 241 can be assigned to all levels of students. Students should first ask themselves how far a player has to run to bring each potato home (to the goal and back, 50 m).
- Label 2 dice with any two-digit numbers having no zeros. A player rolls both dice and makes a multiplication question for the other player to answer.
- One student can play the above game by rolling the dice, doing the question, and checking the answer with a calculator.

## Enrichment

- What are the missing numbers? Each symbol stands for a different number.

$\begin{array}{r} \blacksquare \blacksquare \\ \times 6 \blacksquare \\ \hline 27 \blacksquare \\ 2 \star 00 \\ \hline 2 \blacksquare 7 \blacksquare \end{array}$	$\begin{array}{r} \heartsuit 7 \\ \times 5 \heartsuit \\ \hline 1 \diamond \diamond \\ 2 \star 50 \\ \hline 25 \star \diamond \end{array}$
---	--

- Visit the vice-principal or whoever is in charge of the stockroom. Make a list of certain items and find how many units were ordered in total. (12 pencils per package, 84 packages ordered.) Bring the list back to class for discussion.
- If possible, get the costs of items in the stockroom and figure out totals. (Make sure the examples chosen are appropriate to the skills covered to date.)

## Extra Practice

Multiply.

- |   |  |  |   |   |
|---|--|--|---|---|
| 1. $\begin{array}{r} 22 \\ \times 33 \\ \hline 726 \end{array}$   | 2. $\begin{array}{r} 62 \\ \times 43 \\ \hline 2666 \end{array}$ | 3. $\begin{array}{r} 81 \\ \times 56 \\ \hline 4536 \end{array}$ | 4. $\begin{array}{r} 37 \\ \times 23 \\ \hline 851 \end{array}$   | 5. $\begin{array}{r} 68 \\ \times 31 \\ \hline 2108 \end{array}$  |
| 6. $\begin{array}{r} 29 \\ \times 32 \\ \hline 928 \end{array}$   | 7. $\begin{array}{r} 17 \\ \times 52 \\ \hline 884 \end{array}$  | 8. $\begin{array}{r} 63 \\ \times 75 \\ \hline 4725 \end{array}$ | 9. $\begin{array}{r} 74 \\ \times 53 \\ \hline 3922 \end{array}$  | 10. $\begin{array}{r} 22 \\ \times 45 \\ \hline 990 \end{array}$  |
| 11. $\begin{array}{r} 89 \\ \times 96 \\ \hline 8544 \end{array}$ | 12. $\begin{array}{r} 25 \\ \times 36 \\ \hline 900 \end{array}$ | 13. $\begin{array}{r} 19 \\ \times 49 \\ \hline 931 \end{array}$ | 14. $\begin{array}{r} 98 \\ \times 16 \\ \hline 1568 \end{array}$ | 15. $\begin{array}{r} 50 \\ \times 34 \\ \hline 1700 \end{array}$ |

Solve

- A pony gave rides to small children. The course was 98 m long. How far had the pony walked when he gave 26 rides? **2548 m**

## Worksheet A58

Pages 240-241

# UNIT 11 LESSON 3

## Objective A59

Multiply a three-digit number by a two-digit multiple of 10.

## Introducing the Lesson

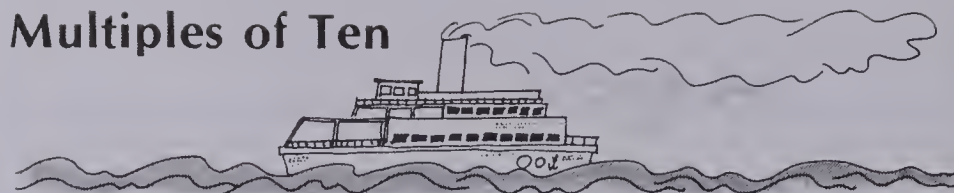
Discuss everyday situations in which people do this kind of multiplication. The examples used in the two previous lessons can be adapted to fit here. Try to include examples related to the theme of the chapter, for example, 20 people in a relay race run 250 m; 153 children each of whom is wearing 20 cm ribbons.

## Teaching the Lesson

Review the multiplication of a three-digit number by a one-digit number using the short form. A chain of examples, such as  $2 \times 4$ ,  $2 \times 74$ ,  $2 \times 174$  might be used to lead up to the example in the lesson. Then work through the lesson example at the chalkboard. Discuss the two stages: multiplication by zero, then by 2. If some students are having difficulty, demonstrate the long form.

$$\begin{array}{r} 174 \\ \times 20 \\ \hline 80 \leftarrow 20 \times 4 \\ 1400 \leftarrow 20 \times 70 \\ 2000 \leftarrow 20 \times 100 \\ \hline 3480 \end{array}$$

## Multiples of Ten



Some of the Burlington picnic will be held on an island. The ferry to the island can carry 174 passengers. How many passengers can it carry in 20 trips?

Write the question

Multiply  
 $0 \times 174$ .

Multiply  
2 tens  $\times$  174

$$\begin{array}{r} 174 \\ \times 20 \\ \hline \end{array}$$

$$\begin{array}{r} 174 \\ \times 20 \\ \hline 0 \end{array}$$

$$\begin{array}{r} 174 \\ \times 20 \\ \hline 3480 \end{array}$$

$$\begin{array}{r} 174 \\ \times 20 \\ \hline 3480 \end{array}$$

The ferry can carry 3480 passengers in 20 trips.

# EXERCISES

Multiply.

$$\begin{array}{r} 1. \quad 123 \\ \times \quad 2 \\ \hline 246 \end{array}$$

$$\begin{array}{r} 2. \quad 123 \\ \times 20 \\ \hline 2460 \end{array}$$

$$\begin{array}{r} 3. \quad 124 \\ \times 20 \\ \hline 2480 \end{array}$$

4. 
$$\begin{array}{r} 234 \\ \times 20 \\ \hline 4680 \end{array}$$

$$\begin{array}{r} 5. \quad 234 \\ \times 10 \\ \hline 2340 \end{array}$$

$$\begin{array}{r} 6. \quad 236 \\ \times \quad 3 \\ \hline 708 \end{array}$$

$$\begin{array}{r} 7. \quad 236 \\ \times 30 \\ \hline 7080 \end{array}$$

$$\begin{array}{r} 8. \quad 237 \\ \times 30 \\ \hline 7110 \end{array}$$

9. 
$$\begin{array}{r} 317 \\ \times 20 \\ \hline 6340 \end{array}$$

10. 
$$\begin{array}{r} 317 \\ \times 30 \\ \hline 9510 \end{array}$$

11. 
$$\begin{array}{r} 245 \\ \times 4 \\ \hline 980 \end{array}$$

$$\begin{array}{r} 12. \quad 245 \\ \times 40 \\ \hline 9800 \end{array}$$

13. 
$$\begin{array}{r} 248 \\ \times 40 \\ \hline 9920 \end{array}$$

14. 
$$\begin{array}{r} 358 \\ \times 30 \\ \hline 10740 \end{array}$$

15. 
$$\begin{array}{r} 358 \\ \times 40 \\ \hline 14320 \end{array}$$

16. 
$$\begin{array}{r} 192 \\ \times 50 \\ \hline 9600 \end{array}$$

$$\begin{array}{r} 17. \quad 328 \\ \times 70 \\ \hline 22960 \end{array}$$

18. 
$$\begin{array}{r} 271 \\ \times 60 \\ \hline 16260 \end{array}$$

$$\begin{array}{r} 19. \quad 536 \\ \times 80 \\ \hline 42880 \end{array}$$

20. 
$$\begin{array}{r} 950 \\ \times 90 \\ \hline 85500 \end{array}$$

## Using the Exercises

- In questions 1 to 15, each row begins with a simple exercise in multiplication by ones to review the basic facts. The rest of each row is a series of related multiplications by multiples of ten.
- Questions 16 to 20 are mixed practice.

## PRACTICE

Multiply.

- |   |   |   |   |   |
|---|---|---|---|---|
| 1. $\begin{array}{r} 432 \\ \times 20 \\ \hline 8640 \end{array}$   | 2. $\begin{array}{r} 302 \\ \times 30 \\ \hline 9060 \end{array}$   | 3. $\begin{array}{r} 514 \\ \times 20 \\ \hline 10280 \end{array}$  | 4. $\begin{array}{r} 620 \\ \times 40 \\ \hline 24800 \end{array}$  | 5. $\begin{array}{r} 623 \\ \times 30 \\ \hline 18690 \end{array}$  |
| 6. $\begin{array}{r} 146 \\ \times 20 \\ \hline 2920 \end{array}$   | 7. $\begin{array}{r} 125 \\ \times 30 \\ \hline 3750 \end{array}$   | 8. $\begin{array}{r} 413 \\ \times 40 \\ \hline 16520 \end{array}$  | 9. $\begin{array}{r} 504 \\ \times 50 \\ \hline 25200 \end{array}$  | 10. $\begin{array}{r} 627 \\ \times 30 \\ \hline 18810 \end{array}$ |
| 11. $\begin{array}{r} 157 \\ \times 20 \\ \hline 3140 \end{array}$  | 12. $\begin{array}{r} 248 \\ \times 30 \\ \hline 7440 \end{array}$  | 13. $\begin{array}{r} 345 \\ \times 40 \\ \hline 13800 \end{array}$ | 14. $\begin{array}{r} 463 \\ \times 50 \\ \hline 23150 \end{array}$ | 15. $\begin{array}{r} 538 \\ \times 40 \\ \hline 21520 \end{array}$ |
| 16. $\begin{array}{r} 567 \\ \times 60 \\ \hline 34020 \end{array}$ | 17. $\begin{array}{r} 678 \\ \times 70 \\ \hline 47460 \end{array}$ | 18. $\begin{array}{r} 789 \\ \times 80 \\ \hline 63120 \end{array}$ | 19. $\begin{array}{r} 876 \\ \times 90 \\ \hline 78840 \end{array}$ | 20. $\begin{array}{r} 965 \\ \times 80 \\ \hline 77200 \end{array}$ |

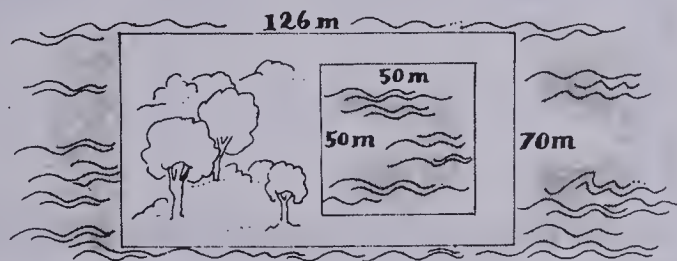
Solve

21. In one of the track events, each runner had to go around the 200 m track 20 times. How many metres is this altogether? Was this more or less than a kilometre? **yes**  
**4000 m** **4 km**
22. The committee had 144 surprise bags made up for the tiny tots. Each bag cost 50¢. How much did the committee pay for the surprise bags? **\$72**
23. In Problem 22, 2 bags cost \$1.00. How does this fact simplify the problem?  $\frac{72}{2} \div 144 = \$72$

## Island Land

Find the area of the land parts of the island.

**6320 m**



243

## Assigning the Practice

Minimum: 1-15, 21

Average: 6-22

Enriched: 11-23

## Reinforcement

The students may use 3 white dice and 1 red die to play a game. They are to make a three-digit number with the numbers on the white dice and a 2-digit multiple of 10 with the number on the red die. These they multiply, then exchange problems with a partner to check. Vary the game by having them make the largest or smallest number possible with the digits.

## Enrichment

- Assign *Island Land* on page 243.
- Visit the custodian to discuss items ordered in bulk (cleaning supplies, garbage bags, etc.). Bring the list to the class. Discuss the amounts needed over 10 months, 20 months, etc.

## Extra Practice

Multiply.

- |   |   |   |   |   |
|---|---|---|---|---|
| 1. $\begin{array}{r} 321 \\ \times 20 \\ \hline 6420 \end{array}$   | 2. $\begin{array}{r} 502 \\ \times 40 \\ \hline 20080 \end{array}$  | 3. $\begin{array}{r} 632 \\ \times 30 \\ \hline 18960 \end{array}$  | 4. $\begin{array}{r} 316 \\ \times 30 \\ \hline 9480 \end{array}$   | 5. $\begin{array}{r} 315 \\ \times 50 \\ \hline 15750 \end{array}$  |
| 6. $\begin{array}{r} 205 \\ \times 40 \\ \hline 8200 \end{array}$   | 7. $\begin{array}{r} 547 \\ \times 20 \\ \hline 10940 \end{array}$  | 8. $\begin{array}{r} 758 \\ \times 60 \\ \hline 45480 \end{array}$  | 9. $\begin{array}{r} 839 \\ \times 50 \\ \hline 41950 \end{array}$  | 10. $\begin{array}{r} 162 \\ \times 90 \\ \hline 14580 \end{array}$ |
| 11. $\begin{array}{r} 957 \\ \times 80 \\ \hline 76560 \end{array}$ | 12. $\begin{array}{r} 641 \\ \times 70 \\ \hline 44870 \end{array}$ | 13. $\begin{array}{r} 293 \\ \times 90 \\ \hline 26370 \end{array}$ | 14. $\begin{array}{r} 409 \\ \times 80 \\ \hline 32720 \end{array}$ | 15. $\begin{array}{r} 255 \\ \times 20 \\ \hline 5100 \end{array}$  |

Solve.

16. By noon, 278 cups of coffee had been sold. Each cup cost 60¢. How much money was taken in for the coffee? **\$166.80**

## Worksheet A59

Pages 242-243



UNIT 11 LESSON 4

Objective A60

Multiply a three-digit number by a two-digit number.

Introducing the Lesson

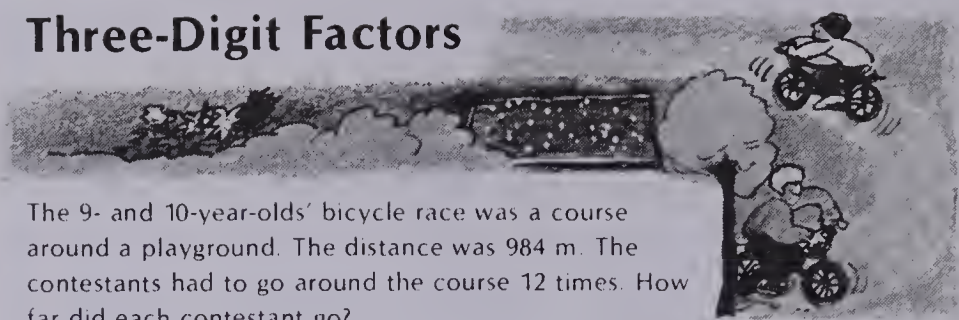
Discuss everyday situations in which three-digit by two-digit multiplication might be used. Many of these examples will involve finding costs, finding measurements, or checking. Use the examples in the preceding lesson to give the pupils ideas. (A ferry ride is 75¢ per child; there are 126 children on the picnic.)

Teaching the Lesson

Review the multiplication of a three-digit number by a one-digit number, and a three-digit number by a multiple of 10.

Use two steps to develop the work in the lesson example ( $2 \times 984$ ,  $10 \times 984$ ). Discuss each step (multiplication by 2, then by 1 ten), emphasizing that the 1 represents ten, so that they enter the 0 in the second stage. Then do the lesson example on the chalkboard.

Three-Digit Factors



The 9- and 10-year-olds' bicycle race was a course around a playground. The distance was 984 m. The contestants had to go around the course 12 times. How far did each contestant go?

Write the question.

Multiply  
 $2 \times 984$ .

Multiply  
1 ten  $\times 984$ .

Add.

$$\begin{array}{r} 984 \\ \times 12 \\ \hline \end{array}$$

$$\begin{array}{r} 984 \\ \times 12 \\ \hline 1968 \end{array}$$

$$\begin{array}{r} 984 \\ \times 12 \\ \hline 1968 \\ 9840 \end{array}$$

$$\begin{array}{r} 984 \\ \times 12 \\ \hline 1968 \\ 9840 \\ \hline 11808 \end{array}$$

$$\begin{array}{r} 984 \\ \times 12 \\ \hline 1968 \\ 9840 \\ \hline 11808 \end{array}$$

Each contestant went 11 808 m

EXERCISES

Multiply.

- |   |   |   |   |   |
|---|---|---|---|---|
| 1. $\begin{array}{r} 423 \\ \times 3 \\ \hline 1269 \end{array}$    | 2. $\begin{array}{r} 423 \\ \times 20 \\ \hline 8460 \end{array}$   | 3. $\begin{array}{r} 423 \\ \times 23 \\ \hline 9729 \end{array}$   | 4. $\begin{array}{r} 216 \\ \times 4 \\ \hline 864 \end{array}$     | 5. $\begin{array}{r} 216 \\ \times 30 \\ \hline 6480 \end{array}$   |
| 6. $\begin{array}{r} 216 \\ \times 34 \\ \hline 7344 \end{array}$   | 7. $\begin{array}{r} 543 \\ \times 5 \\ \hline 2715 \end{array}$    | 8. $\begin{array}{r} 543 \\ \times 40 \\ \hline 21720 \end{array}$  | 9. $\begin{array}{r} 543 \\ \times 45 \\ \hline 24435 \end{array}$  | 10. $\begin{array}{r} 617 \\ \times 2 \\ \hline 1234 \end{array}$   |
| 11. $\begin{array}{r} 617 \\ \times 60 \\ \hline 37020 \end{array}$ | 12. $\begin{array}{r} 617 \\ \times 62 \\ \hline 38254 \end{array}$ | 13. $\begin{array}{r} 396 \\ \times 8 \\ \hline 3168 \end{array}$   | 14. $\begin{array}{r} 396 \\ \times 50 \\ \hline 19800 \end{array}$ | 15. $\begin{array}{r} 396 \\ \times 58 \\ \hline 22968 \end{array}$ |
| 16. $\begin{array}{r} 129 \\ \times 47 \\ \hline 6063 \end{array}$  | 17. $\begin{array}{r} 235 \\ \times 92 \\ \hline 21620 \end{array}$ | 18. $\begin{array}{r} 834 \\ \times 83 \\ \hline 69222 \end{array}$ | 19. $\begin{array}{r} 285 \\ \times 27 \\ \hline 7695 \end{array}$  | 20. $\begin{array}{r} 494 \\ \times 74 \\ \hline 36556 \end{array}$ |

Using the Exercises

- Questions 1 to 15 are structured so that two preliminary steps precede each problem.
- Questions 16 to 20 are mixed practice.

## PRACTICE

Multiply.

- |   |   |   |   |   |
|---|---|---|---|---|
| 1. $\begin{array}{r} 132 \\ \times 21 \\ \hline 2772 \end{array}$   | 2. $\begin{array}{r} 302 \\ \times 32 \\ \hline 9664 \end{array}$   | 3. $\begin{array}{r} 421 \\ \times 43 \\ \hline 18103 \end{array}$  | 4. $\begin{array}{r} 530 \\ \times 52 \\ \hline 27560 \end{array}$  | 5. $\begin{array}{r} 543 \\ \times 12 \\ \hline 6516 \end{array}$   |
| 6. $\begin{array}{r} 145 \\ \times 22 \\ \hline 3190 \end{array}$   | 7. $\begin{array}{r} 236 \\ \times 12 \\ \hline 2832 \end{array}$   | 8. $\begin{array}{r} 408 \\ \times 34 \\ \hline 13872 \end{array}$  | 9. $\begin{array}{r} 523 \\ \times 43 \\ \hline 22489 \end{array}$  | 10. $\begin{array}{r} 419 \\ \times 35 \\ \hline 14665 \end{array}$ |
| 11. $\begin{array}{r} 165 \\ \times 24 \\ \hline 3960 \end{array}$  | 12. $\begin{array}{r} 257 \\ \times 32 \\ \hline 8224 \end{array}$  | 13. $\begin{array}{r} 370 \\ \times 21 \\ \hline 7770 \end{array}$  | 14. $\begin{array}{r} 186 \\ \times 45 \\ \hline 8370 \end{array}$  | 15. $\begin{array}{r} 287 \\ \times 23 \\ \hline 6601 \end{array}$  |
| 16. $\begin{array}{r} 648 \\ \times 67 \\ \hline 43416 \end{array}$ | 17. $\begin{array}{r} 754 \\ \times 75 \\ \hline 56550 \end{array}$ | 18. $\begin{array}{r} 896 \\ \times 68 \\ \hline 60928 \end{array}$ | 19. $\begin{array}{r} 783 \\ \times 98 \\ \hline 76734 \end{array}$ | 20. $\begin{array}{r} 695 \\ \times 84 \\ \hline 58380 \end{array}$ |

Solve.

21. The picnic and field day cost the town \$18 per adult. About 775 adults attended. What was the total cost? **\$13 950**

## REVIEW

Multiply.

- |     |  |   |   |   |   |
|-----|--|---|---|---|---|
| A57 | 1. $\begin{array}{r} 21 \\ \times 30 \\ \hline 630 \end{array}$    | 2. $\begin{array}{r} 74 \\ \times 20 \\ \hline 1480 \end{array}$    | 3. $\begin{array}{r} 18 \\ \times 40 \\ \hline 720 \end{array}$     | 4. $\begin{array}{r} 46 \\ \times 70 \\ \hline 3220 \end{array}$    | 5. $\begin{array}{r} 79 \\ \times 80 \\ \hline 6320 \end{array}$    |
| A58 | 6. $\begin{array}{r} 32 \\ \times 23 \\ \hline 736 \end{array}$    | 7. $\begin{array}{r} 52 \\ \times 43 \\ \hline 2236 \end{array}$    | 8. $\begin{array}{r} 26 \\ \times 31 \\ \hline 806 \end{array}$     | 9. $\begin{array}{r} 67 \\ \times 65 \\ \hline 4355 \end{array}$    | 10. $\begin{array}{r} 86 \\ \times 74 \\ \hline 6364 \end{array}$   |
| A59 | 11. $\begin{array}{r} 312 \\ \times 30 \\ \hline 9360 \end{array}$ | 12. $\begin{array}{r} 601 \\ \times 40 \\ \hline 24040 \end{array}$ | 13. $\begin{array}{r} 326 \\ \times 30 \\ \hline 9780 \end{array}$  | 14. $\begin{array}{r} 457 \\ \times 50 \\ \hline 22850 \end{array}$ | 15. $\begin{array}{r} 769 \\ \times 70 \\ \hline 53830 \end{array}$ |
| A60 | 16. $\begin{array}{r} 124 \\ \times 21 \\ \hline 2604 \end{array}$ | 17. $\begin{array}{r} 513 \\ \times 32 \\ \hline 16416 \end{array}$ | 18. $\begin{array}{r} 627 \\ \times 23 \\ \hline 14421 \end{array}$ | 19. $\begin{array}{r} 586 \\ \times 67 \\ \hline 39262 \end{array}$ | 20. $\begin{array}{r} 968 \\ \times 85 \\ \hline 82280 \end{array}$ |

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## Assigning the Practice

Minimum: 1-15

Average: 6-21

Enriched: 11-21

## Review Exercises

Questions	Objective	Pages
1-5	A57	238-239
6-10	A58	240-241
11-15	A59	242-243
16-20	A60	244-245

## Reinforcement

Group the students in pairs and assign this activity.

List 5 three-digit numbers. Multiply each by 23. Time yourself on the clock. Give the list to a partner. Exchange lists and do the other student's questions. For which set of questions does each have the better time?

## Enrichment

Have the students make up story problems requiring the multiplication of three-digit and two-digit numbers using this information.

There are 138 people at the beach.

Hot dogs cost 75¢.

Drinks cost 45¢.

French fries cost 35¢.

## Extra Practice

Multiply.

- |   |   |   |   |   |
|---|---|---|---|---|
| 1. $\begin{array}{r} 413 \\ \times 21 \\ \hline 8673 \end{array}$   | 2. $\begin{array}{r} 403 \\ \times 33 \\ \hline 13299 \end{array}$  | 3. $\begin{array}{r} 532 \\ \times 23 \\ \hline 12236 \end{array}$  | 4. $\begin{array}{r} 138 \\ \times 12 \\ \hline 1656 \end{array}$   | 5. $\begin{array}{r} 605 \\ \times 22 \\ \hline 13310 \end{array}$  |
| 6. $\begin{array}{r} 417 \\ \times 34 \\ \hline 14178 \end{array}$  | 7. $\begin{array}{r} 525 \\ \times 32 \\ \hline 16800 \end{array}$  | 8. $\begin{array}{r} 469 \\ \times 67 \\ \hline 31423 \end{array}$  | 9. $\begin{array}{r} 673 \\ \times 75 \\ \hline 50475 \end{array}$  | 10. $\begin{array}{r} 172 \\ \times 45 \\ \hline 7740 \end{array}$  |
| 11. $\begin{array}{r} 827 \\ \times 82 \\ \hline 67814 \end{array}$ | 12. $\begin{array}{r} 467 \\ \times 43 \\ \hline 20081 \end{array}$ | 13. $\begin{array}{r} 202 \\ \times 85 \\ \hline 17170 \end{array}$ | 14. $\begin{array}{r} 246 \\ \times 55 \\ \hline 13530 \end{array}$ | 15. $\begin{array}{r} 524 \\ \times 93 \\ \hline 48732 \end{array}$ |

Solve.

16. To make pickled eggs, 116 dozen eggs were used. How many is this altogether? **1392**

## Worksheet A60

Pages 244-245

# UNIT 11 LESSON 5

## Objective A61

Divide a three-digit dividend by a one-digit divisor with no remainder. (Each digit of the dividend is a multiple of the divisor.)

## Introducing the Lesson

Review everyday uses of division: the sharing of food and drink, the sharing of money and material things, the packing of items into cartons, the seating of people, and the division of measurements. Include examples that might arise in a community field day and picnic.

## Teaching the Lesson

Use blocks of hundreds, tens, and ones to work through the lesson example.

$$248 \div 2$$

Divide into 2 equal groups.

Then develop this division numerically at the chalkboard.

2 hundreds divided by 2 is 1 hundred.

$$\begin{array}{r} 100 \\ 2 \overline{)200} \end{array} \text{ or } \begin{array}{r} 1 \\ 2 \overline{)200} \end{array}$$

4 tens divided by 2 is 2 tens

$$\begin{array}{r} 20 \\ 2 \overline{)40} \end{array} \text{ or } \begin{array}{r} 2 \\ 2 \overline{)40} \end{array}$$

8 ones divided by 2 is 4 ones.

$$\begin{array}{r} 4 \\ 2 \overline{)8} \end{array}$$

Then do the lesson example on page 246 at the chalkboard. As you work through the example, reintroduce the algorithm steps: **Estimate**, **Multiply**, and **Subtract**.

Emphasize the place value of the digits in the quotient. Discuss other examples ( $699 \div 3$ ;  $848 \div 4$ ) in the same way. Use blocks first, then the numerical method.

Stress the checking step: multiply the quotient by the divisor to check the answer.

## Three-Digit Dividends

For the scavenger hunt, the children worked in pairs: one older child with one younger child. In all, 248 children took part in the scavenger hunt. How many younger children went on the hunt?

Write the question.

$$2 \overline{)248}$$

Divide the hundreds.

$$\begin{array}{r} 1 \\ 2 \overline{)248} \\ -2 \\ \hline 0 \end{array}$$

Divide the tens.

$$\begin{array}{r} 12 \\ 2 \overline{)248} \\ -2 \\ \hline 04 \\ -4 \\ \hline 0 \end{array}$$

Divide the ones.

$$\begin{array}{r} 124 \\ 2 \overline{)248} \\ -2 \\ \hline 04 \\ -4 \\ \hline 08 \\ -8 \\ \hline 0 \end{array}$$

Check:

$$\begin{array}{r} 124 \\ \times 2 \\ \hline 248 \end{array}$$

124 younger children went on the scavenger hunt.

## EXERCISES

Copy and complete each division.

- |   |   |   |   |   |
|---|---|---|---|---|
| 1. $\begin{array}{r} 12 \blacksquare 3 \\ 2 \overline{)246} \\ -2 \\ \hline 04 \\ -4 \\ \hline 06 \\ 4 \blacksquare \\ 3 \blacksquare \blacksquare \end{array}$ | 2. $\begin{array}{r} 32 \blacksquare 1 \\ 3 \overline{)963} \\ -9 \\ \hline 06 \\ -6 \\ \hline 03 \\ 4 \blacksquare \blacksquare \end{array}$ | 3. $\begin{array}{r} 12 \blacksquare 1 \\ 4 \overline{)484} \\ -4 \\ \hline 08 \\ -8 \\ \hline 04 \\ 2 \blacksquare \blacksquare \end{array}$ | 4. $\begin{array}{r} 11 \blacksquare 1 \\ 5 \overline{)555} \\ -5 \\ \hline 05 \\ -5 \\ \hline 05 \\ 2 \blacksquare \blacksquare \end{array}$ | 5. $\begin{array}{r} 11 \blacksquare 1 \\ 6 \overline{)666} \\ -6 \\ \hline 06 \\ -6 \\ \hline 06 \\ 1 \blacksquare \blacksquare \end{array}$ |
| 6. $\begin{array}{r} 4 \blacksquare 1 \\ 2 \overline{)682} \\ -6 \\ \hline 08 \\ 3 \blacksquare \blacksquare \end{array}$                                       | 7. $\begin{array}{r} 32 \blacksquare \\ 2 \overline{)864} \\ -8 \\ \hline 06 \\ 4 \blacksquare \blacksquare \end{array}$                      | 8. $\begin{array}{r} 33 \blacksquare \\ 3 \overline{)699} \\ -6 \\ \hline 09 \\ 2 \blacksquare \blacksquare \end{array}$                      | 9. $\begin{array}{r} 11 \blacksquare \\ 4 \overline{)844} \\ -8 \\ \hline 04 \\ 2 \blacksquare \blacksquare \end{array}$                      | 10. $\begin{array}{r} 11 \blacksquare \\ 7 \overline{)777} \\ -7 \\ \hline 07 \\ 1 \blacksquare \blacksquare \end{array}$                     |
| 11. $\begin{array}{r} 242 \\ 2 \overline{)484} \end{array}$   | 12. $\begin{array}{r} 132 \\ 3 \overline{)396} \end{array}$   | 13. $\begin{array}{r} 231 \\ 3 \overline{)693} \end{array}$   | 14. $\begin{array}{r} 111 \\ 8 \overline{)888} \end{array}$   | 15. $\begin{array}{r} 111 \\ 9 \overline{)999} \end{array}$   |

## Using the Exercises

- The exercises lead the students to mastery of the routine by showing them how each exercise is done, and by gradually leaving more for the students to do. The first example should be teacher-guided.



## PRACTICE

Divide.

1.  $2 \overline{)222}$       2.  $3 \overline{)336}$       3.  $4 \overline{)488}$       4.  $5 \overline{)555}$       5.  $6 \overline{)666}$
6.  $1 \overline{)284}$       7.  $2 \overline{)426}$       8.  $3 \overline{)693}$       9.  $4 \overline{)844}$       10.  $7 \overline{)777}$
11.  $8 \overline{)888}$       12.  $3 \overline{)636}$       13.  $3 \overline{)669}$       14.  $2 \overline{)648}$       15.  $4 \overline{)484}$

Divide. Check your answer

16.  $1 \overline{)111}$       17.  $2 \overline{)422}$       18.  $3 \overline{)969}$       19.  $2 \overline{)846}$       20.  $4 \overline{)848}$
21.  $2 \overline{)646}$       22.  $3 \overline{)369}$       23.  $4 \overline{)444}$       24.  $3 \overline{)399}$       25.  $2 \overline{)882}$
26.  $9 \overline{)999}$       27.  $3 \overline{)993}$       28.  $3 \overline{)936}$       29.  $2 \overline{)824}$       30.  $2 \overline{)268}$

Write a division sentence for each multiplication.

31.  $123 \times 1 = 123$       32.  $213 \times 3 = 639$       33.  $111 \times 6 = 666$
34.  $324 \times 2 = 648$       35.  $122 \times 4 = 484$       36.  $100 \times 9 = 900$

Solve.

37. One of the relay races was 366 m long. There were 3 children on each team. How far did each team member run? **122 m**
38. The hot dog stand was open for 4 hours before it ran out of hot dogs. They took in \$848. About how much money did they take in each hour? **\$212**

## Alphabet Soup

Here are three division puzzles.

Each letter stands for a different digit.

Find the missing digits.

$$\begin{aligned} n &= 1 \\ x &= 6 \\ a &= 3 \\ r &= 2 \end{aligned}$$

$$\begin{array}{r} n \ n \ n \\ 6 \overline{) x \ x \ x} \end{array}$$

$$\begin{array}{r} 2 \ n \ a \\ a \overline{) x \ a \ 9} \end{array}$$

$$\begin{array}{r} n \ n \ r \\ r \overline{) r \ r \ 4} \end{array}$$

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## Extra Practice

Divide.

1.  $2 \overline{)242}$       2.  $3 \overline{)366}$       3.  $4 \overline{)448}$       4.  $3 \overline{)963}$
5.  $5 \overline{)555}$       6.  $6 \overline{)666}$       7.  $2 \overline{)684}$       8.  $4 \overline{)848}$
9.  $7 \overline{)777}$       10.  $2 \overline{)844}$       11.  $3 \overline{)996}$       12.  $4 \overline{)488}$

Solve.

13. At the picnic, all the children with red hair got a 3-scoop ice cream cone free. 339 scoops of ice cream were used for this. How many children with red hair got free ice cream cones? **113**

## Assigning the Practice

Minimum: 1-15, 37

Average: 16-30, 37

Enriched: 16-38

## Reinforcement

1. Play a game using cards numbered with three-digit multiples of the numbers 2, 3, and 4 (in each number, all the digits must be multiples of the same number). A player draws a card and must think of a one-digit number that will divide his drawn number evenly. Score one point for each correct answer.

2. Those having difficulty should do only questions with 2 as a divisor. Then they may do divisions by 5, because these tables are the most familiar to them and there will be no frustration in using the 2 and 5 times tables. They will be working on the division concept. When accuracy has been mastered they can try other tables, but move slowly.

## Enrichment

1. Assign *Alphabet Soup* on page 247.

2. Do missing-digit questions.

$$\begin{array}{r} 3 \ 2 \ \square \\ 2 \overline{) 6 \ \square \ 8} \\ \underline{\square} \downarrow \\ 0 \ \square \\ \underline{4} \\ 0 \ 8 \\ \underline{\square} \\ 0 \end{array}$$

## Worksheet A61

Pages 246-247

# UNIT 11 LESSON 6

## Objective A63

Divide a three-digit dividend by a one-digit divisor with no remainder. (The second digit of the dividend is not a multiple of the divisor.)

## Introducing the Lesson

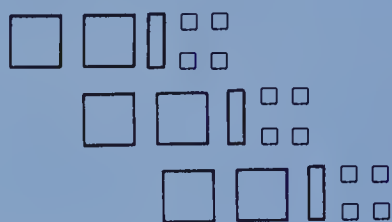
Discuss everyday situations in which division is used for sharing, packing, seating, and measuring. Use the examples in the preceding lessons to give the pupils ideas. Include community field day and picnic applications.

## Teaching the Lesson

Use hundreds, tens, and ones blocks to work through the lesson example. Represent the dividend by 6 blocks of 100, 4 blocks of 10, and 2 unit blocks.



Try to arrange the blocks in 3 equal groups. Elicit the suggestion to exchange 1 ten block for 10 ones.



Then do the numerical method of division for the lesson example at the chalkboard. Emphasize the place value of the digits in the quotient. Demonstrate each step using the place-value blocks.

In this lesson the first digit (hundreds digit) of the dividend is a multiple of the divisor. Show related examples before doing the lesson example.

$$3 \overline{)632} \quad 3 \overline{)42} \quad 3 \overline{)642}$$

Do other examples ( $345 \div 3$ ;  $474 \div 2$ ) using blocks before proceeding to the numerical method for the division.

The routine should be explained as three applications of the estimate, multiply, and subtract cycle.

Have students check their answers by multiplication.

## Three-Digit Dividends

The canoe race was 642 m long. It was divided into 3 equal sections by rafts. When Gina went around the first raft, how far had she canoed?



Write the question.

Divide the hundreds.

Divide the tens.

Divide.

$$3 \overline{)642}$$

$$\begin{array}{r} 2 \\ 3 \overline{)642} \\ \underline{-6} \\ 0 \end{array}$$

$$\begin{array}{r} 21 \\ 3 \overline{)642} \\ \underline{-6} \phantom{0} \\ 04 \\ \underline{-3} \\ 1 \end{array}$$

$$\begin{array}{r} 214 \\ 3 \overline{)642} \\ \underline{-6} \phantom{0} \\ 04 \\ \underline{-3} \phantom{0} \\ 12 \\ \underline{-12} \\ 0 \end{array}$$

Check:

$$\begin{array}{r} 214 \\ \times 3 \\ \hline 642 \end{array}$$

She had canoed 214 m.

## EXERCISES

Copy and complete each division.

- |   |   |   |   |  |
|---|---|---|---|--|
| 1. $2 \overline{)234}$<br>$\underline{-2}$<br>03<br>$\underline{-2}$<br>14  | 2. $2 \overline{)456}$<br>$\underline{-4}$<br>05<br>$\underline{-4}$<br>16  | 3. $3 \overline{)345}$<br>$\underline{-3}$<br>04<br>$\underline{-3}$<br>15  | 4. $3 \overline{)972}$<br>$\underline{-9}$<br>07<br>$\underline{-6}$<br>12  | 5. $5 \overline{)560}$<br>$\underline{-5}$<br>06<br>$\underline{-5}$<br>10   |
| 6. $2 \overline{)472}$<br>$\underline{-4}$<br>07<br>$\underline{-4}$<br>329 | 7. $3 \overline{)648}$<br>$\underline{-6}$<br>04<br>$\underline{-3}$<br>218 | 8. $3 \overline{)975}$<br>$\underline{-9}$<br>07<br>$\underline{-6}$<br>218 | 9. $4 \overline{)496}$<br>$\underline{-4}$<br>09<br>$\underline{-8}$<br>113 | 10. $6 \overline{)672}$<br>$\underline{-6}$<br>07<br>$\underline{-6}$<br>112 |
| 11. $2 \overline{)658}$   | 12. $3 \overline{)654}$   | 13. $4 \overline{)872}$   | 14. $7 \overline{)791}$   | 15. $8 \overline{)896}$  |

## Using the Exercises

- The exercises lead the students to mastery of the division process by showing them how each exercise is done, and by gradually leaving more for them to do.

## PRACTICE

Divide.

- |                                    |                                    |                                    |                                    |                                    |
|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|
| 1. $2 \overline{)230}$ <b>115</b>  | 2. $3 \overline{)345}$ <b>115</b>  | 3. $4 \overline{)452}$ <b>113</b>  | 4. $5 \overline{)565}$ <b>113</b>  | 5. $6 \overline{)678}$ <b>113</b>  |
| 6. $2 \overline{)256}$ <b>128</b>  | 7. $3 \overline{)351}$ <b>117</b>  | 8. $4 \overline{)464}$ <b>216</b>  | 9. $7 \overline{)784}$ <b>112</b>  | 10. $8 \overline{)896}$ <b>112</b> |
| 11. $6 \overline{)684}$ <b>114</b> | 12. $2 \overline{)472}$ <b>236</b> | 13. $5 \overline{)580}$ <b>118</b> | 14. $3 \overline{)987}$ <b>329</b> | 15. $4 \overline{)876}$ <b>219</b> |

Divide. Check your answer.

- |                                    |                                    |                                    |                                    |                                    |
|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|
| 16. $2 \overline{)456}$ <b>228</b> | 17. $3 \overline{)354}$ <b>118</b> | 18. $4 \overline{)468}$ <b>117</b> | 19. $5 \overline{)575}$ <b>115</b> | 20. $6 \overline{)690}$ <b>115</b> |
| 21. $2 \overline{)674}$ <b>337</b> | 22. $3 \overline{)678}$ <b>226</b> | 23. $4 \overline{)472}$ <b>118</b> | 24. $6 \overline{)672}$ <b>112</b> | 25. $7 \overline{)791}$ <b>113</b> |
| 26. $7 \overline{)798}$ <b>114</b> | 27. $3 \overline{)948}$ <b>316</b> | 28. $5 \overline{)570}$ <b>114</b> | 29. $2 \overline{)898}$ <b>449</b> | 30. $4 \overline{)856}$ <b>214</b> |

Write a division sentence for each multiplication.

- |                          |                          |                          |
|--------------------------|--------------------------|--------------------------|
| 31. $116 \times 2 = 232$ | 32. $124 \times 4 = 496$ | 33. $115 \times 6 = 690$ |
| 34. $232 \div 2 = 116$   | 35. $496 \div 4 = 124$   | 36. $690 \div 6 = 115$   |
| $975 \div 3 = 325$       | $585 \div 5 = 117$       | $784 \div 7 = 112$       |

Solve.

37. Mark was serving ice cream, 2 scoops to a customer. He made 238 scoops. How many customers did Mark serve? **119**
38. A cruise boat took people on a trip for \$5 each. The money taken in for one cruise was \$575. How many people took the cruise? **115**

## Counter Trick

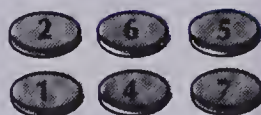
Make two rows of counters.

The sum of the numbers in the top row is 13.

The sum of the numbers in the bottom row is 12.

Move two of the counters so that the

sums of each row are the same.



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## Assigning the Practice

Minimum: 1-15

Average: 16-30, 37

Enriched: 16-38

## Reinforcement

1. Students who are having difficulty should deal with only one multiplication table until the concept is mastered.

2. Use a calculator and 2 dice (labelled with three-digit numerals with 4 or 8 in the hundreds place, one labelled with 2's and 4's). Each player rolls the dice and composes a division question. The next player finds the answer using a calculator. If the dice roller is correct, the dice are passed on to the next player. If the roller is incorrect, he or she must roll again until the correct answer is given.

## Enrichment

Assign *Counter Trick* on page 249. The numbers on the counters total 25, therefore no two rows can have the same sum if the counters are moved in a conventional way. Good problem solvers will realize this and look for an unconventional solution. If the "1" and "2" are turned upside down, the sum of each row is then 11. Alternatively, a counter in each row may be moved and placed on top of the "1" and "2" so that those numbers are no longer visible.

## Extra Practice

Divide

- |                                   |                                    |                                    |                                    |
|-----------------------------------|------------------------------------|------------------------------------|------------------------------------|
| 1. $2 \overline{)436}$ <b>218</b> | 2. $3 \overline{)645}$ <b>215</b>  | 3. $4 \overline{)452}$ <b>113</b>  | 4. $7 \overline{)784}$ <b>112</b>  |
| 5. $3 \overline{)981}$ <b>327</b> | 6. $5 \overline{)570}$ <b>114</b>  | 7. $6 \overline{)684}$ <b>114</b>  | 8. $4 \overline{)868}$ <b>217</b>  |
| 9. $2 \overline{)678}$ <b>339</b> | 10. $7 \overline{)798}$ <b>114</b> | 11. $8 \overline{)896}$ <b>112</b> | 12. $5 \overline{)595}$ <b>119</b> |

Solve.

13. The field day organizers want to have places for 672 people at picnic tables. Six people can sit at a table. How many tables should they order? **112**

## Worksheet A62

Pages 248-249



Objective A63

Divide a three-digit dividend by a one-digit divisor with no remainder. (The first two digits of the dividend are not multiples of the divisor.)

Introducing the Lesson

Have students make up division problems related to supplying food for a large picnic. For example, there will be 192 people at the picnic. If the pies are cut into 8 pieces, how many pies will be needed so that there will be one piece for everyone at the picnic?

Teaching the Lesson

Use hundreds, tens, and ones blocks to work through the lesson example.

508 ÷ 4



There will be a hundred block in each group with 1 hundred left over. Elicit the suggestion to exchange 1 hundred for 10 tens. There will be 2 tens in each group.



There will be 2 tens left over.

Elicit the suggestion to exchange the 2 tens for 20 ones and put them with the 8 ones. Divide the 28 ones into four equal groups.



Then do the numerical method of division for this example at the chalkboard.

Do several other examples (675 ÷ 5; 916 ÷ 4) in the same way. Use blocks and the numerical method.

The division routine should be explained as three applications of the estimate, multiply, and subtract cycle.

Remind students how to check their answers using multiplication.

Three-Digit Dividends



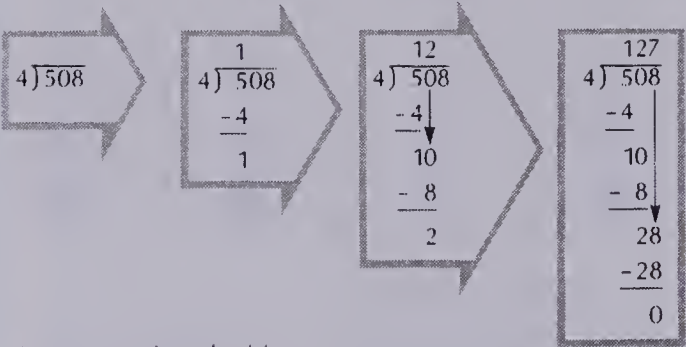
For the watermelon-eating contests, watermelons were cut into 4 pieces each. The organizer counted 508 pieces. How many watermelons had been cut?

Write the question.

Divide the hundreds.

Divide

Divide



Check:  
127  
× 4  
508

127 watermelons had been cut.

EXERCISES

Copy and complete each division

- |                                |                                |                                |                                |                                |
|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| 1. $2 \overline{)312}$<br>156  | 2. $3 \overline{)747}$<br>249  | 3. $4 \overline{)624}$<br>156  | 4. $5 \overline{)675}$<br>135  | 5. $6 \overline{)942}$<br>157  |
| 6. $2 \overline{)574}$<br>287  | 7. $3 \overline{)852}$<br>284  | 8. $4 \overline{)912}$<br>228  | 9. $5 \overline{)780}$<br>156  | 10. $7 \overline{)861}$<br>123 |
| 11. $2 \overline{)976}$<br>488 | 12. $3 \overline{)588}$<br>196 | 13. $4 \overline{)756}$<br>189 | 14. $6 \overline{)972}$<br>162 | 15. $8 \overline{)992}$<br>124 |

Using the Exercises

- The exercises lead the students to mastery of the numerical method of division by showing them how each exercise is done, and by gradually leaving more of each exercise for them to do.

## PRACTICE

Divide.

- |                                    |                                    |                                    |                                    |                                    |
|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|
| 1. $2 \overline{)352}$ <b>176</b>  | 2. $3 \overline{)465}$ <b>155</b>  | 3. $4 \overline{)536}$ <b>134</b>  | 4. $5 \overline{)665}$ <b>133</b>  | 5. $6 \overline{)744}$ <b>124</b>  |
| 6. $2 \overline{)574}$ <b>287</b>  | 7. $3 \overline{)528}$ <b>176</b>  | 8. $4 \overline{)632}$ <b>158</b>  | 9. $7 \overline{)854}$ <b>122</b>  | 10. $8 \overline{)904}$ <b>113</b> |
| 11. $7 \overline{)938}$ <b>134</b> | 12. $4 \overline{)756}$ <b>189</b> | 13. $5 \overline{)760}$ <b>152</b> | 14. $3 \overline{)747}$ <b>249</b> | 15. $6 \overline{)852}$ <b>142</b> |

Divide. Check your answer.

- |                                    |                                    |                                    |                                    |                                    |
|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|
| 16. $2 \overline{)734}$ <b>367</b> | 17. $3 \overline{)561}$ <b>187</b> | 18. $4 \overline{)588}$ <b>147</b> | 19. $5 \overline{)830}$ <b>166</b> | 20. $6 \overline{)774}$ <b>129</b> |
| 21. $2 \overline{)976}$ <b>488</b> | 22. $3 \overline{)714}$ <b>238</b> | 23. $4 \overline{)692}$ <b>173</b> | 24. $7 \overline{)875}$ <b>125</b> | 25. $8 \overline{)984}$ <b>123</b> |
| 26. $6 \overline{)954}$ <b>159</b> | 27. $2 \overline{)978}$ <b>489</b> | 28. $5 \overline{)945}$ <b>189</b> | 29. $4 \overline{)996}$ <b>249</b> | 30. $3 \overline{)888}$ <b>296</b> |

Write a division sentence for each multiplication.

- |  |  |  |
|--|--|--|
| 31. $125 \times 2 = 250$<br><b><math>250 \div 2 = 125</math></b> | 32. $137 \times 4 = 548$<br><b><math>548 \div 4 = 137</math></b> | 33. $156 \times 6 = 936$<br><b><math>936 \div 6 = 156</math></b> |
| 34. $257 \times 3 = 771$<br><b><math>771 \div 3 = 257</math></b> | 35. $148 \times 5 = 740$<br><b><math>740 \div 5 = 148</math></b> | 36. $134 \times 7 = 938$<br><b><math>938 \div 7 = 134</math></b> |

Solve.

37. The hot dog stand expects to sell 952 hot dogs. The buns come in packages of 8. How many packages of buns should they order? **119 packages**
38. The kilometre race was really only 984 m. Each runner went around a track 6 times. How many metres was each lap? **164 m**  
How short of one kilometre was the course? **16 m**

## Consumer Problem

The organizers estimate that they will need 984 servings of milk for the children at the picnic. They expect to get 4 servings of milk from every litre. How many 2 L cartons of milk should they buy for the picnic? **123 cartons**

251

## Assigning the Practice

Minimum: 1-15

Average: 16-30, 37

Enriched: 16-38

## Reinforcement

For those having difficulty, do only questions with 2 as divisors until the concept is mastered. Then try 5 as the divisor. When confidence has been achieved, try a mixture.

## Enrichment

The *Consumer Problem* on page 251 can be assigned to average or better students. It is a two-step problem.

## Extra Practice

Divide.

- |                                   |                                    |                                    |                                    |
|-----------------------------------|------------------------------------|------------------------------------|------------------------------------|
| 1. $2 \overline{)476}$ <b>238</b> | 2. $3 \overline{)561}$ <b>187</b>  | 3. $4 \overline{)628}$ <b>157</b>  | 4. $3 \overline{)714}$ <b>238</b>  |
| 5. $5 \overline{)620}$ <b>124</b> | 6. $6 \overline{)876}$ <b>146</b>  | 7. $2 \overline{)794}$ <b>397</b>  | 8. $7 \overline{)861}$ <b>123</b>  |
| 9. $8 \overline{)992}$ <b>124</b> | 10. $5 \overline{)725}$ <b>145</b> | 11. $6 \overline{)930}$ <b>155</b> | 12. $7 \overline{)917}$ <b>131</b> |

Solve.

13. There are 7 sticks of gum in a package. The clown wants 959 sticks to give away. How many packages of gum does he need? **137**

## Worksheet A63

Pages 250-251

# UNIT 11 LESSON 8

## Objective A64

Divide a three-digit dividend by a one-digit divisor with a remainder.

## Introducing the Lesson

Review Lessons 2, 6, and 9 of Unit 9 on remainders in division with two-digit and three-digit dividends and two-digit quotients. Point out that this lesson involves the same concept using the division skills covered so far in this unit.

Remind students how to check answers when there is a remainder.

$$\begin{array}{r} 13 \text{ R}1 \\ 3 \overline{)40} \\ \underline{39} \\ 1 \end{array}$$

Multiply: divisor  $\times$  quotient.

$$\begin{array}{r} 13 \\ \times 3 \\ \hline 39 \\ + 1 \\ \hline 40 \end{array}$$

Add remainder.

Dividend.

## Teaching the Lesson

This lesson is mainly a review of previous skills and will serve to provide ample practice in the division algorithm.

Use hundreds, tens, and ones blocks to work through the lesson example.

$$900 \div 8$$

Divide the blocks into 8 equal groups.

There will be 1 hundred block left over. Elicit the suggestion to exchange the hundred block for 10 tens. Divide these up.

There will be 2 tens left over. Elicit the suggestion to exchange them for 20 ones.

There will be 4 ones left over.

Do several other examples ( $650 \div 3$ ;  $931 \div 4$ ) in the same way. Use blocks and the numerical method.

The division routine should be explained as three applications of the estimate, multiply, and subtract cycle.

## Remainders

The organizers of the picnic want 900 sparklers for the children. The sparklers come in packages of 8. How many packages do they need?

Write the question. Divide the hundreds. Divide. Divide. Write the remainder.

$$\begin{array}{r} 8 \overline{)900} \\ \underline{8} \\ 10 \\ \underline{8} \\ 20 \\ \underline{16} \\ 4 \end{array}$$

They need 112 packages, and 4 more sparklers.

How many packages should they order?

## EXERCISES

Copy and complete each division.

1. $2 \overline{)247}$ $\underline{-2}$ 04 $\underline{-4}$ 07 <b>12 R1</b>	2. $3 \overline{)650}$ $\underline{-6}$ 05 $\underline{-3}$ 20 <b>21 R2</b>	3. $4 \overline{)541}$ $\underline{-4}$ 14 $\underline{-12}$ 21 <b>13 R3</b>	4. $5 \overline{)579}$ $\underline{-5}$ 07 $\underline{-5}$ 29 <b>11 R4</b>	5. $6 \overline{)839}$ $\underline{-6}$ 23 $\underline{-18}$ 59 <b>13 R5</b>
6. $2 \overline{)361}$ $\underline{-2}$ 16 <b>18 R1</b>	7. $3 \overline{)767}$ $\underline{-6}$ 16 <b>25 R2</b>	8. $4 \overline{)930}$ $\underline{-8}$ 13 <b>23 R2</b>	9. $5 \overline{)984}$ $\underline{-5}$ 48 <b>19 R4</b>	10. $7 \overline{)789}$ $\underline{-7}$ 08 <b>11 R5</b>
11. $5 \overline{)763}$ <b>152 R3</b>	12. $6 \overline{)790}$ <b>131 R4</b>	13. $7 \overline{)900}$ <b>128 R4</b>	14. $8 \overline{)903}$ <b>112 R7</b>	15. $8 \overline{)899}$ <b>112 R3</b>

## Using the Exercises

- The exercises help the students to master the numerical method of division by showing them how each exercise is done. Gradually more of each exercise is left to the student.



## PRACTICE

Divide.

- |                                       |                                       |                                       |                                       |                                       |
|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
| 1. $2 \overline{)265}$ <b>132 R1</b>  | 2. $3 \overline{)635}$ <b>211 R2</b>  | 3. $4 \overline{)847}$ <b>211 R3</b>  | 4. $5 \overline{)559}$ <b>111 R4</b>  | 5. $6 \overline{)668}$ <b>111 R2</b>  |
| 6. $2 \overline{)459}$ <b>229 R1</b>  | 7. $3 \overline{)685}$ <b>228 R1</b>  | 8. $4 \overline{)471}$ <b>117 R3</b>  | 9. $7 \overline{)785}$ <b>112 R1</b>  | 10. $8 \overline{)893}$ <b>111 R5</b> |
| 11. $7 \overline{)976}$ <b>139 R3</b> | 12. $4 \overline{)713}$ <b>178 R1</b> | 13. $6 \overline{)995}$ <b>165 R5</b> | 14. $5 \overline{)824}$ <b>164 R4</b> | 15. $3 \overline{)850}$ <b>283 R1</b> |

Divide. Check your answer.

- |                                       |                                       |                                       |                                       |                                       |
|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
| 16. $2 \overline{)687}$ <b>343 R1</b> | 17. $3 \overline{)968}$ <b>322 R2</b> | 18. $4 \overline{)445}$ <b>111 R1</b> | 19. $5 \overline{)556}$ <b>111 R1</b> | 20. $6 \overline{)669}$ <b>111 R3</b> |
| 21. $2 \overline{)873}$ <b>436 R1</b> | 22. $3 \overline{)944}$ <b>314 R2</b> | 23. $4 \overline{)857}$ <b>214 R1</b> | 24. $7 \overline{)797}$ <b>113 R6</b> | 25. $8 \overline{)899}$ <b>112 R3</b> |
| 26. $6 \overline{)887}$ <b>147 R5</b> | 27. $4 \overline{)905}$ <b>226 R1</b> | 28. $8 \overline{)900}$ <b>112 R4</b> | 29. $3 \overline{)779}$ <b>259 R2</b> | 30. $5 \overline{)866}$ <b>173 R1</b> |

Solve

31. The expenses of the Burlington picnic were \$650 more than expected. The Lion's Club decided to raise the money by having each member contribute \$4. How many members are in the Lion's Club? **163 members cover expenses**
32. In the afternoon there were 3 softball games. The total attendance was 322 men, 212 women, and 311 children. The crowds were almost evenly divided. About how many people watched each game? **282**

## USING THE CALCULATOR

Use your calculator to do these. Which ones divide evenly?

- |                          |                         |                         |
|--------------------------|-------------------------|-------------------------|
| $1023 \div 3$ <b>341</b> | $921 \div 3$ <b>307</b> | $2474 \div 3$ <b>no</b> |
| $792 \div 3$ <b>264</b>  | $85 \div 3$ <b>no</b>   | $96 \div 3$ <b>32</b>   |

Find the sum of the digits in each dividend.

Can you state a rule for numbers evenly divisible by 3? by 9?

**If digits are multiples of 3 (9) when summed, they are also divisible by 3 (9).**

253

## Assigning the Practice

Minimum: 1-15

Average: 16-21

Enriched: 16-32

## Reinforcement

1. Using the Calculator on page 253 can be assigned to all students. A number is divisible by 3 (or 9) if the sum of its digits is divisible by 3 (or 9). Note: To understand this mathematically, suppose  $ABC$  is a 3-digit numeral. The value of this numeral is:

$$100A + 10B + C$$

$$\begin{aligned} \text{Now } & \frac{100A + 10B + C}{3} \\ &= \frac{99A + 9B + A + B + C}{3} \\ &= 33A + 3B + \frac{A + B + C}{3} \end{aligned}$$

So if  $ABC$  is divisible by 3, then  $A + B + C$  must also be divisible by 3. The same proof applies to divisibility by 9.

2. As described before, those having difficulty should be using 2 as a divisor. Have them progress slowly so that confidence is built. Then move to 5 as a divisor, and so on.

## Enrichment

Assign missing digit division problems.

$\begin{array}{r} 16\Box R2 \\ 4 \overline{) \Box 54} \\ -4 \phantom{0} \\ \hline \Box 5 \\ -\Box \phantom{0} \\ \hline 14 \\ -12 \\ \hline 2 \end{array}$	$\begin{array}{r} 1\Box\Box R2 \\ 5 \overline{) 6\Box\Box} \\ -5 \phantom{00} \\ \hline 1\Box \\ -10 \\ \hline 4\Box \\ -45 \\ \hline 2 \end{array}$	$\begin{array}{r} \Box\Box\Box R2 \\ 7 \overline{) 8\Box\Box} \\ -\Box \phantom{00} \\ \hline \Box\Box \\ -\Box 4 \\ \hline \Box\Box \\ -49 \\ \hline 2 \end{array}$
--	--	--

Students can make up other missing digit problems to challenge their friends.

## Extra Practice

Divide

- |                                      |                                       |                                       |                                       |
|--------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
| 1. $2 \overline{)483}$ <b>241 R1</b> | 2. $3 \overline{)368}$ <b>122 R2</b>  | 3. $4 \overline{)847}$ <b>211 R3</b>  | 4. $3 \overline{)647}$ <b>215 R2</b>  |
| 5. $5 \overline{)575}$ <b>115</b>    | 6. $6 \overline{)696}$ <b>116</b>     | 7. $2 \overline{)379}$ <b>189 R1</b>  | 8. $7 \overline{)895}$ <b>127 R6</b>  |
| 9. $8 \overline{)906}$ <b>113 R2</b> | 10. $4 \overline{)729}$ <b>182 R1</b> | 11. $5 \overline{)618}$ <b>123 R3</b> | 12. $3 \overline{)850}$ <b>283 R1</b> |

Solve.

13. There were 800 people at the Elmvale picnic. How many tables of 6 were needed to seat all the people? **133 R2**

# UNIT 11 LESSON 9

## Objective A65

Divide a three-digit dividend by a one-digit divisor where there is a zero in the quotient.

### Introducing the Lesson

Discuss everyday situations in which division is used for sharing, packing, seating, and measuring. Use the examples in the preceding lessons to give the pupils ideas. Include community field day and picnic applications. Review the basic division facts involving 0, such as:

$$\begin{array}{r} 0 \\ 4 \overline{)0} \end{array} \quad \begin{array}{r} 0 \\ 7 \overline{)0} \end{array} \quad \begin{array}{r} 0 \text{ R}2 \\ 4 \overline{)2} \end{array} \quad \begin{array}{r} 0 \text{ R}5 \\ 7 \overline{)5} \end{array}$$

### Teaching the Lesson

Use hundreds, tens, and ones blocks to work through the lesson example.

$$\begin{array}{r} 9 \overline{)918} \\ \underline{-9} \phantom{0} \\ 0 \end{array}$$

There are one ten and 8 ones left.

$$\begin{array}{r} 1 \\ 9 \overline{)918} \\ \underline{-9} \phantom{0} \\ 01 \end{array}$$

There are less than 9 tens. Recall  $1 \div 9 = 0 \text{ R}1$

$$\begin{array}{r} 10 \\ 9 \overline{)918} \\ \underline{-9} \phantom{0} \\ 01 \end{array}$$

Regroup the ten as 10 ones and divide.

$$\begin{array}{r} 10 \\ 9 \overline{)918} \\ \underline{-9} \phantom{0} \\ 01 \phantom{0} \\ \underline{-0} \phantom{0} \\ 18 \end{array} \longrightarrow \begin{array}{r} 102 \\ 9 \overline{)918} \\ \underline{-9} \phantom{0} \\ 01 \phantom{0} \\ \underline{-0} \phantom{0} \\ 18 \phantom{0} \\ \underline{-18} \\ 0 \end{array}$$

Do several other examples ( $510 \div 5$ ;  $603 \div 3$ ;  $617 \div 2$ ) in the same way. Use blocks and the numerical method.

Have the pupils check their answers by multiplication.

## Zero in the Quotient

The food committee thought they would need to grill 918 hamburgers at the picnic. A kilogram of ground beef makes 9 hamburgers. How many kilograms of ground beef did they order?



Write the question.

Divide the hundreds.

Divide the tens.

Divide.

$$\begin{array}{r} 9 \overline{)918} \end{array}$$

$$\begin{array}{r} 1 \\ 9 \overline{)918} \\ \underline{-9} \phantom{0} \\ 0 \end{array}$$

$$\begin{array}{r} 10 \\ 9 \overline{)918} \\ \underline{-9} \phantom{0} \\ 01 \phantom{0} \\ \underline{-0} \phantom{0} \\ 1 \end{array}$$

$$\begin{array}{r} 102 \\ 9 \overline{)918} \\ \underline{-9} \phantom{0} \\ 01 \phantom{0} \\ \underline{-0} \phantom{0} \\ 18 \phantom{0} \\ \underline{-18} \\ 0 \end{array}$$

Check:

$$\begin{array}{r} 102 \\ \times 9 \\ \hline 918 \end{array}$$

They ordered 102 kg of ground beef

### EXERCISES

Copy and complete each division.

1. $\begin{array}{r} 1 \text{ R}8 \\ 2 \overline{)216} \\ \underline{-2} \phantom{0} \\ 01 \phantom{0} \\ \underline{-0} \phantom{0} \\ 16 \end{array}$	2. $\begin{array}{r} 23 \text{ R} \square \\ 3 \overline{)692} \\ \underline{-6} \phantom{0} \\ 09 \phantom{0} \\ \underline{-9} \phantom{0} \\ 02 \end{array}$	3. $\begin{array}{r} 2 \text{ R}9 \text{ R} \square \\ 4 \overline{)837} \\ \underline{-8} \phantom{0} \\ 03 \phantom{0} \\ \underline{-0} \phantom{0} \\ 37 \end{array}$	4. $\begin{array}{r} 1 \text{ R} \square \\ 5 \overline{)508} \\ \underline{-5} \phantom{0} \\ 00 \phantom{0} \\ \underline{-0} \phantom{0} \\ 08 \end{array}$	5. $\begin{array}{r} 11 \text{ R} \square \\ 6 \overline{)665} \\ \underline{-6} \phantom{0} \\ 06 \phantom{0} \\ \underline{-6} \phantom{0} \\ 05 \end{array}$
6. $\begin{array}{r} 50 \text{ R}1 \\ 2 \text{ R} \square \text{ R} \square \\ 2 \overline{)501} \\ \underline{-4} \phantom{0} \\ 10 \phantom{0} \\ \underline{-10} \phantom{0} \\ 01 \end{array}$	7. $\begin{array}{r} 05 \\ 3 \text{ R} \square \\ 3 \overline{)915} \\ \underline{-9} \phantom{0} \\ 01 \phantom{0} \\ \underline{-0} \phantom{0} \\ 01 \end{array}$	8. $\begin{array}{r} 90 \text{ R}2 \\ 1 \text{ R} \square \text{ R} \square \\ 4 \overline{)762} \\ \underline{-4} \phantom{0} \\ 36 \phantom{0} \\ \underline{-36} \phantom{0} \\ 02 \end{array}$	9. $\begin{array}{r} 10 \text{ R}5 \\ 1 \text{ R} \square \text{ R} \square \\ 7 \overline{)775} \\ \underline{-7} \phantom{0} \\ 07 \phantom{0} \\ \underline{-07} \phantom{0} \\ 00 \end{array}$	10. $\begin{array}{r} 08 \text{ R}6 \\ 1 \text{ R} \square \text{ R} \square \\ 8 \overline{)870} \\ \underline{-8} \phantom{0} \\ 07 \phantom{0} \\ \underline{-07} \phantom{0} \\ 00 \end{array}$
11. $\begin{array}{r} 403 \text{ R}1 \\ 2 \overline{)807} \\ \underline{-4} \phantom{0} \\ 00 \phantom{0} \\ \underline{-0} \phantom{0} \\ 07 \end{array}$	12. $\begin{array}{r} 120 \\ 3 \overline{)360} \\ \underline{-3} \phantom{0} \\ 00 \phantom{0} \\ \underline{-0} \phantom{0} \\ 00 \end{array}$	13. $\begin{array}{r} 109 \text{ R}3 \\ 4 \overline{)439} \\ \underline{-4} \phantom{0} \\ 03 \phantom{0} \\ \underline{-03} \phantom{0} \\ 09 \end{array}$	14. $\begin{array}{r} 104 \\ 8 \overline{)832} \\ \underline{-8} \phantom{0} \\ 03 \phantom{0} \\ \underline{-03} \phantom{0} \\ 02 \end{array}$	15. $\begin{array}{r} 109 \text{ R}8 \\ 9 \overline{)989} \\ \underline{-9} \phantom{0} \\ 08 \phantom{0} \\ \underline{-08} \phantom{0} \\ 09 \end{array}$

254

### Using the Exercises

- The exercises take the students through the same numerical steps that were used in the lesson example. If the results show poor understanding, work through more examples with the place-value blocks.

Divide.

1.  $2 \overline{)421}$  **210 R1**  
 2.  $3 \overline{)452}$  **150 R2**  
 3.  $4 \overline{)840}$  **210**  
 4.  $5 \overline{)654}$  **130 R4**  
 5.  $6 \overline{)720}$  **120**  
 6.  $2 \overline{)412}$  **206**  
 7.  $3 \overline{)627}$  **209**  
 8.  $4 \overline{)436}$  **109**  
 9.  $7 \overline{)769}$  **109 R6**  
 10.  $8 \overline{)855}$  **106 R7**  
 11.  $8 \overline{)871}$  **108 R7**  
 12.  $4 \overline{)484}$  **121**  
 13.  $6 \overline{)643}$  **107 R1**  
 14.  $5 \overline{)852}$  **170 R2**  
 15.  $3 \overline{)612}$  **204**

Divide. Check your answer.

16.  $2 \overline{)260}$  **130**  
 17.  $3 \overline{)961}$  **320 R1**  
 18.  $4 \overline{)683}$  **170 R3**  
 19.  $5 \overline{)753}$  **150 R3**  
 20.  $6 \overline{)844}$  **140 R4**  
 21.  $2 \overline{)607}$  **303 R1**  
 22.  $3 \overline{)918}$  **306**  
 23.  $4 \overline{)832}$  **208**  
 24.  $7 \overline{)745}$  **106 R3**  
 25.  $8 \overline{)877}$  **109 R5**  
 26.  $6 \overline{)605}$  **100 R5**  
 27.  $4 \overline{)721}$  **180 R1**  
 28.  $5 \overline{)524}$  **104 R4**  
 29.  $7 \overline{)630}$  **90**  
 30.  $3 \overline{)629}$  **209 R2**

Solve.

31. A bakery made 540 cookies for the Burlington picnic. They made the cookies in 5 batches. How many cookies were made in each batch? **108 cookies**  
 32. At the picnic, children under age ten got three tickets each for rides. 627 tickets were given out. How many children got the tickets? **209 children**

## I'm Thinking of a Number

It comes between 800 and 830.  
 Dividing by 2 gives a remainder of 1.  
 Dividing by 5 gives a remainder of 3.  
 Dividing by 7 gives a quotient of 117.  
 What is the number? **823**



255

## Assigning the Practice

Minimum: 1-15  
 Average: 16-31  
 Enriched: 16-32

## Reinforcement

Use two dice marked as follows:

1 die: 2, 3, 4, 2, 3, 4

1 die: 406, 742, 397, 846, 523, 647

Roll the dice, divide, and get a remainder. Tally the remainders. Alternate turns until one player reaches 12.

## Enrichment

1. Assign *I'm Thinking of a Number* on page 255. Students can "guess and test", but a better solution is to make a list of numbers such that  $N \div 7 = 117 R$ . The numbers are 819, 820, 821, 822, 823, 824, 825. Divide by 2 and 5 until the correct number applies (823).

2. Have the students make up division questions so that the quotient has 0 tens. Include examples with and without remainders.

## Extra Practice

Divide.

1.  $2 \overline{)640}$  **320**  
 2.  $3 \overline{)482}$  **160 R2**  
 3.  $4 \overline{)563}$  **140 R3**  
 4.  $3 \overline{)628}$  **209 R1**  
 5.  $4 \overline{)428}$  **107**  
 6.  $5 \overline{)547}$  **109 R2**  
 7.  $6 \overline{)655}$  **109 R1**  
 8.  $7 \overline{)844}$  **120 R4**  
 9.  $8 \overline{)879}$  **109 R7**  
 10.  $9 \overline{)927}$  **103**  
 11.  $7 \overline{)706}$  **100 R6**  
 12.  $9 \overline{)983}$  **109 R2**

Solve.

13. The Fish and Chips booth sold dinners for \$2. At supper time they took in \$212. How many dinners did they sell? **106**

## Worksheet A65

Pages 254-255



## UNIT 11 LESSON 10

### Objective PS11

Solve problems involving extraneous information.

### Introducing the Lesson

Review the four steps (Facts, Decide, Arithmetic, Answer) in the solution of problems and the essential features of each step. In the *Facts* step, the numerical facts are listed and identified. In the *Decide* step, the key words are located and we decide what operation to use. In the *Arithmetic* step, the numerical calculation is performed. In the *Answer* step the required result is stated and checked.

### Teaching the Lesson

Make sure that the students realize the necessity for having at least two numbers to carry out any of the four basic operations; in some cases three or more numbers are required. The students will need many oral questions in order to associate specific facts with the directed questions. For example, the question, "How much does it cost to buy a certain number of cans?" should trigger the responses, "How many cans?" and "How much each?"

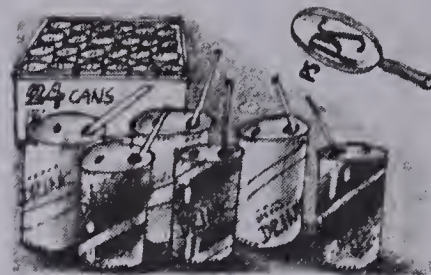
Read the problem in the textbook. Point out that students should concentrate on what is being asked: "How many cans of soft drink were sold?"

The information "400 people" doesn't help unless we know how many cans each person bought.

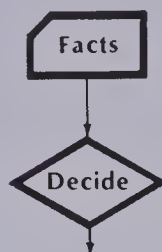
To use "25 cartons", we need to know how many cans are in a carton. We are told this: "24 cans in each carton". The cost (30¢ per can) doesn't help unless we know the total sales dollars taken in for soft drinks.

### Extra Information

Over 400 people attended a picnic.  
In all, 25 cartons of soft drinks were sold  
There were 24 cans in each carton  
Each can cost 30¢  
How many cans of soft drinks were sold?



This problem has too much information. What facts do you need?



400 people  
25 cartons of soft drinks  
24 cans in each carton  
30¢ each

To find **how many** cans,  
multiply  $24 \times 25$

### EXERCISES

Copy the facts needed to solve each problem

- Four-litre cans of fruit sell for \$5 each. How much will 6 cans cost?  $\$5 \times 6 = \$30$
- A 2 kg package of hamburger costs \$10. Mr. Clancy wants 20 kg of hamburger. How many 2 kg packages should he buy?  $20 \text{ kg} \div 2 \text{ kg} = 10$
- A room is 4 m wide, 3 m high, and 5 m long. What is the area of the floor?  $4 \text{ m} \times 5 \text{ m} = 20 \text{ m}^2$
- Sarah is 10 years old. She earns \$3 a week on her paper route. How much does she earn in 4 weeks?  $\$3 \times 4 = \$12$
- Sam bought a 284 mL can of pop for 40¢. He bought a 32 g candy bar for 30¢. How much did he spend?  $40¢ + 30¢ = 70¢$

### Using the Exercises

- Read through the problems with the students. In each one, analyse the question being asked. Examine each fact given and ask if it will help to solve the problem. If the answer is yes, ask what else you need to know to solve the problem. Read the problem again to see if the other needed fact is given. If not, examine the next fact in the same way.

## PRACTICE

Find the facts needed in each problem. Solve.

- Susan won the race for 9-year-old girls. Her time was 14.0 seconds. Janet's time was 14.4 seconds. Ingrid's time was 15.3 seconds. By how much did Ingrid lose?  $15.3 - 14.0 = 1.3$
- A carton of peanuts has 4 layers with 24 bags in each layer. A vendor ordered 5 cartons. How many bags of peanuts are there in a carton?  $24 \times 4 = 96$
- About 500 people will attend the Sandy Hill picnic. The hot dog stand expects to sell 750 hot dogs. Buns come in packages of 8. How many packages of buns should the stand order?  $750 \div 8 \approx \text{about } 94 \text{ packages}$
- Mrs. Kemp gave Sharon \$5.00 for rides and food at the Fair. She gave Kurt \$3.50. Sharon had \$0.10 left over. What was the difference in the amounts Mrs. Kemp gave Sharon and Kurt?  $\$5.00 - \$3.50 = \$1.50$

## REVIEW

- |     |  |  |  |  |
|-----|--|--|--|--|
| A61 | Divide. $\frac{362}{1 \overline{)362}}$    | $\frac{111}{8 \overline{)888}}$            | $\frac{121}{4 \overline{)484}}$            | $\frac{213}{3 \overline{)639}}$            |
| A62 | $\frac{112}{7 \overline{)784}}$            | $\frac{115}{5 \overline{)575}}$            | $\frac{218}{4 \overline{)872}}$            | $\frac{229}{3 \overline{)687}}$            |
| A63 | $\frac{124}{6 \overline{)744}}$            | $\frac{176}{5 \overline{)880}}$            | $\frac{174}{4 \overline{)696}}$            | $\frac{267}{3 \overline{)801}}$            |
| A64 | $\frac{162 \text{ R2}}{6 \overline{)974}}$ | $\frac{113 \text{ R5}}{7 \overline{)796}}$ | $\frac{112 \text{ R3}}{8 \overline{)899}}$ | $\frac{259 \text{ R2}}{3 \overline{)779}}$ |
| A65 | $\frac{109 \text{ R3}}{7 \overline{)766}}$ | $\frac{170 \text{ R3}}{4 \overline{)683}}$ | $\frac{303 \text{ R1}}{2 \overline{)607}}$ | $\frac{306}{3 \overline{)918}}$            |

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## Assigning the Practice

Minimum: 1-4

Average: 1-4

Enriched: 1-4

## Review Exercises

Questions	Objective	Pages
1-4	A61	246-247
5-8	A62	248-249
9-12	A63	250-251
13-16	A64	252-253
17-20	A65	254-255

## Reinforcement

- Have the pupils make up problems about a picnic or planning a field day that contain extra information.
- Discuss everyday situations that are really extra information problems.

## Enrichment

Invite the Physical Education Consultant or whoever organizes the field day in your area to come into class and discuss some of the things that must be considered when planning such an event. Have the students take notes and prepare problems to be solved by the class.

## Extra Practice

## Worksheet PS11

Pages 256-257

Find the facts needed in each problem. Solve.

- Four prizes are to be raffled off. 265 people each buy three \$1 tickets. How much does each person spend?  $\$3$
- The prizes for the Fish Pond cost 9¢ each. The organizers bought 210 prizes. 195 children fished at the Fish Pond. How much did the prizes cost the organizers?  $\$18.90$
- Swimming races were held in a pool 25 m long. There were 8 people in each race. They swam 10 lengths of the pool. How far did each person swim?  $250 \text{ m}$

## Problem Solving Activities

Assign Level 4, Unit 11

Unit 11 Objective	Test Questions	Pages
A57	1-5	238-239
A58	6-10	240-241
A59	11-15	242-243
A60	16-20	244-245
A61	21-25	246-247
A62	26-30	248-249
A63	31-35	250-251
A64	36-40	252-253
A65	41-45	254-255
PS	46	

# TEST

# UNIT 11

Multiply.

1.  $\begin{array}{r} 56 \\ \times 30 \\ \hline 1680 \end{array}$
2.  $\begin{array}{r} 27 \\ \times 60 \\ \hline 1620 \end{array}$
3.  $\begin{array}{r} 37 \\ \times 50 \\ \hline 1850 \end{array}$
4.  $\begin{array}{r} 42 \\ \times 40 \\ \hline 1680 \end{array}$
5.  $\begin{array}{r} 67 \\ \times 80 \\ \hline 5360 \end{array}$
6.  $\begin{array}{r} 27 \\ \times 45 \\ \hline 1215 \end{array}$
7.  $\begin{array}{r} 35 \\ \times 62 \\ \hline 2170 \end{array}$
8.  $\begin{array}{r} 91 \\ \times 19 \\ \hline 1729 \end{array}$
9.  $\begin{array}{r} 45 \\ \times 26 \\ \hline 1170 \end{array}$
10.  $\begin{array}{r} 73 \\ \times 34 \\ \hline 2482 \end{array}$
11.  $\begin{array}{r} 293 \\ \times 50 \\ \hline 14650 \end{array}$
12.  $\begin{array}{r} 427 \\ \times 70 \\ \hline 29890 \end{array}$
13.  $\begin{array}{r} 361 \\ \times 60 \\ \hline 21660 \end{array}$
14.  $\begin{array}{r} 546 \\ \times 80 \\ \hline 43680 \end{array}$
15.  $\begin{array}{r} 940 \\ \times 40 \\ \hline 37600 \end{array}$
16.  $\begin{array}{r} 225 \\ \times 43 \\ \hline 9675 \end{array}$
17.  $\begin{array}{r} 354 \\ \times 72 \\ \hline 25488 \end{array}$
18.  $\begin{array}{r} 834 \\ \times 63 \\ \hline 52542 \end{array}$
19.  $\begin{array}{r} 285 \\ \times 38 \\ \hline 10830 \end{array}$
20.  $\begin{array}{r} 492 \\ \times 94 \\ \hline 46248 \end{array}$

Divide.

21.  $\begin{array}{r} 134 \\ 2 \overline{)268} \end{array}$
22.  $\begin{array}{r} 213 \\ 3 \overline{)639} \end{array}$
23.  $\begin{array}{r} 122 \\ 4 \overline{)488} \end{array}$
24.  $\begin{array}{r} 111 \\ 5 \overline{)555} \end{array}$
25.  $\begin{array}{r} 412 \\ 2 \overline{)824} \end{array}$
26.  $\begin{array}{r} 228 \\ 2 \overline{)456} \end{array}$
27.  $\begin{array}{r} 126 \\ 3 \overline{)378} \end{array}$
28.  $\begin{array}{r} 217 \\ 4 \overline{)868} \end{array}$
29.  $\begin{array}{r} 113 \\ 5 \overline{)565} \end{array}$
30.  $\begin{array}{r} 112 \\ 7 \overline{)784} \end{array}$
31.  $\begin{array}{r} 166 \\ 2 \overline{)332} \end{array}$
32.  $\begin{array}{r} 145 \\ 3 \overline{)435} \end{array}$
33.  $\begin{array}{r} 124 \\ 5 \overline{)620} \end{array}$
34.  $\begin{array}{r} 114 \\ 8 \overline{)912} \end{array}$
35.  $\begin{array}{r} 239 \\ 4 \overline{)956} \end{array}$
36.  $\begin{array}{r} 322 R2 \\ 3 \overline{)968} \end{array}$
37.  $\begin{array}{r} 213 R3 \\ 4 \overline{)855} \end{array}$
38.  $\begin{array}{r} 111 R3 \\ 6 \overline{)669} \end{array}$
39.  $\begin{array}{r} 293 R1 \\ 2 \overline{)587} \end{array}$
40.  $\begin{array}{r} 122 R1 \\ 7 \overline{)855} \end{array}$
41.  $\begin{array}{r} 102 \\ 4 \overline{)408} \end{array}$
42.  $\begin{array}{r} 130 \\ 2 \overline{)260} \end{array}$
43.  $\begin{array}{r} 306 \\ 3 \overline{)918} \end{array}$
44.  $\begin{array}{r} 105 R1 \\ 7 \overline{)736} \end{array}$
45.  $\begin{array}{r} 105 R2 \\ 5 \overline{)527} \end{array}$

Solve.

46. Sari sold lemonade for 30¢ a cup. She sold 19 cups the first day and 7 cups the second day. How much money did she take in the first day?  $30¢ \times 19 = \$5.70$

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## Post-test

## Unit 11

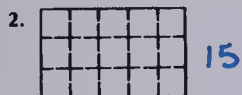
Multiply.

1.  $\begin{array}{r} 57 \\ \times 10 \\ \hline 570 \end{array}$
2.  $\begin{array}{r} 31 \\ \times 60 \\ \hline 1860 \end{array}$
3.  $\begin{array}{r} 58 \\ \times 40 \\ \hline 2320 \end{array}$
4.  $\begin{array}{r} 17 \\ \times 90 \\ \hline 1530 \end{array}$
5.  $\begin{array}{r} 32 \\ \times 50 \\ \hline 1600 \end{array}$
6.  $\begin{array}{r} 43 \\ \times 12 \\ \hline 516 \end{array}$
7.  $\begin{array}{r} 56 \\ \times 17 \\ \hline 952 \end{array}$
8.  $\begin{array}{r} 48 \\ \times 29 \\ \hline 1392 \end{array}$
9.  $\begin{array}{r} 92 \\ \times 45 \\ \hline 4140 \end{array}$
10.  $\begin{array}{r} 63 \\ \times 87 \\ \hline 5481 \end{array}$
11.  $\begin{array}{r} 159 \\ \times 10 \\ \hline 1590 \end{array}$
12.  $\begin{array}{r} 233 \\ \times 30 \\ \hline 6990 \end{array}$
13.  $\begin{array}{r} 117 \\ \times 90 \\ \hline 10530 \end{array}$
14.  $\begin{array}{r} 341 \\ \times 80 \\ \hline 27280 \end{array}$
15.  $\begin{array}{r} 874 \\ \times 60 \\ \hline 52440 \end{array}$
16.  $\begin{array}{r} 243 \\ \times 12 \\ \hline 2916 \end{array}$
17.  $\begin{array}{r} 985 \\ \times 13 \\ \hline 12805 \end{array}$
18.  $\begin{array}{r} 615 \\ \times 28 \\ \hline 17220 \end{array}$
19.  $\begin{array}{r} 209 \\ \times 37 \\ \hline 7733 \end{array}$
20.  $\begin{array}{r} 643 \\ \times 52 \\ \hline 33436 \end{array}$

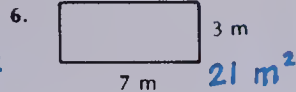
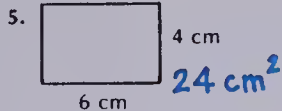
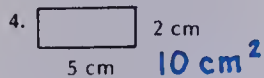


# MEASUREMENT

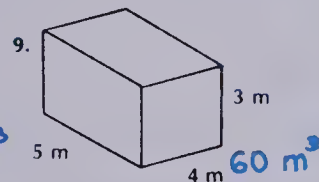
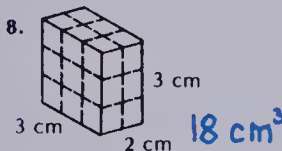
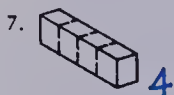
What is the area of each surface?



What is the area in square centimetres or square metres?



What is the volume?



Solve.

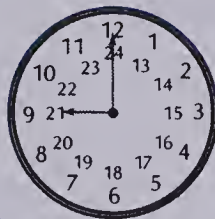
10. John kept a record of how long it took him to do his homework one week. The times were: 20 min, 35 min, 40 min, 30 min, and 50 min. What was the average length of time he spent on homework each night? 35 min

11. The scale on a map is 1 cm = 5 km. The map distance between two places is 4 cm. What is the actual distance between the two places? 20 km

12. How many hours are there in a day? 24 h

13. How many months are there in 2 years? 24

14. What time is it if the clock is showing a morning time? 09:00



15. What time is it on the 24 hour clock if the clock is showing an evening time? 21:00

Divide.

21.  $2 \overline{)682}$  341    22.  $4 \overline{)848}$  212    23.  $3 \overline{)936}$  312    24.  $7 \overline{)777}$  111    25.  $2 \overline{)840}$  420

26.  $4 \overline{)872}$  218    27.  $2 \overline{)436}$  218    28.  $5 \overline{)575}$  115    29.  $3 \overline{)954}$  318    30.  $6 \overline{)684}$  114

31.  $2 \overline{)524}$  262    32.  $4 \overline{)632}$  158    33.  $5 \overline{)725}$  145    34.  $8 \overline{)998}$  124 R6    35.  $7 \overline{)896}$  128

36.  $4 \overline{)895}$  223 R3    37.  $5 \overline{)657}$  131 R2    38.  $9 \overline{)992}$  110 R2    39.  $6 \overline{)957}$  159 R3    40.  $3 \overline{)588}$  196

41.  $3 \overline{)906}$  302    42.  $6 \overline{)654}$  109    43.  $4 \overline{)839}$  209 R3    44.  $2 \overline{)619}$  309 R1    45.  $9 \overline{)989}$  109 R8

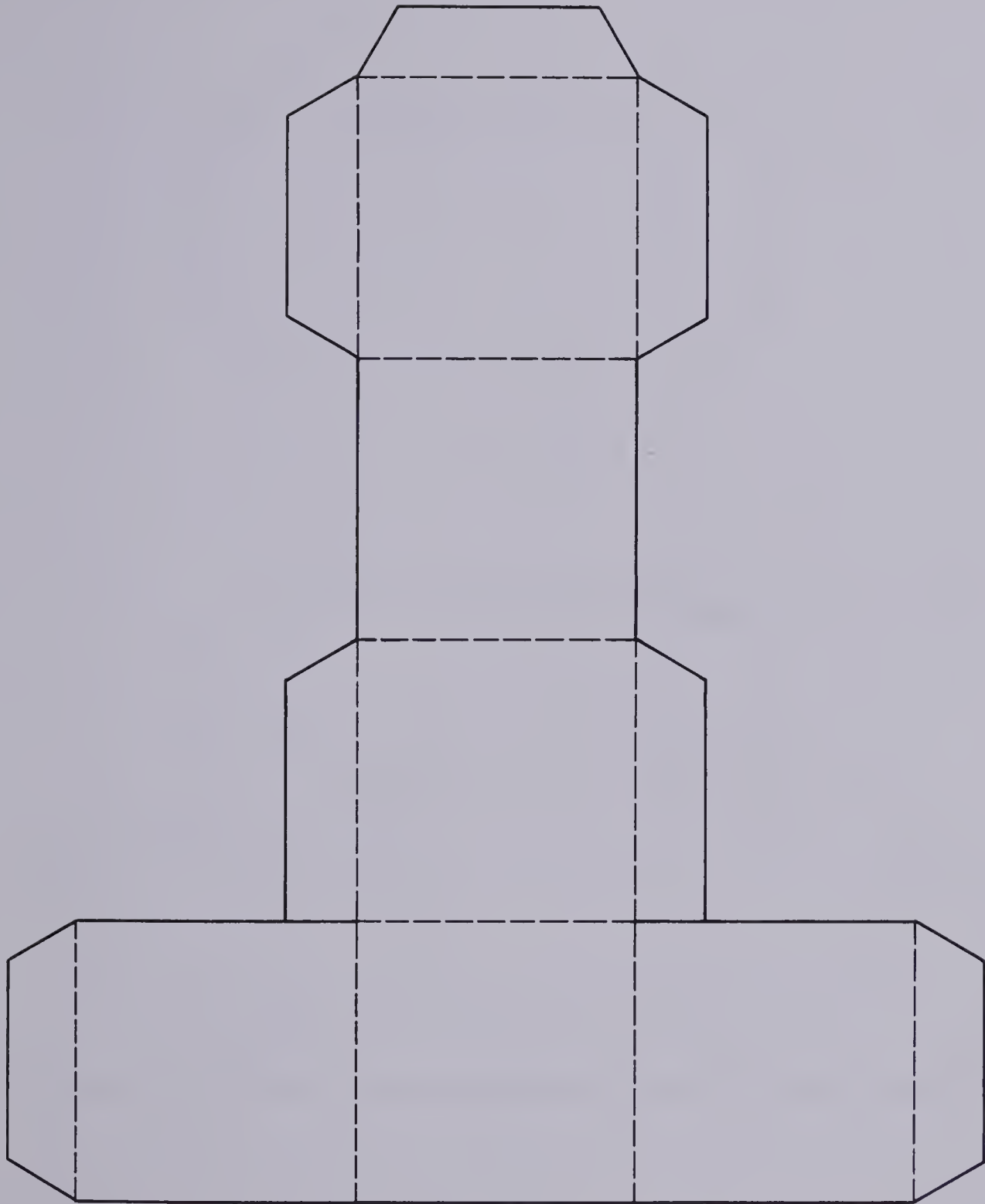
# UNIT 12

## Geometry

Theme: Geometry in the Real World

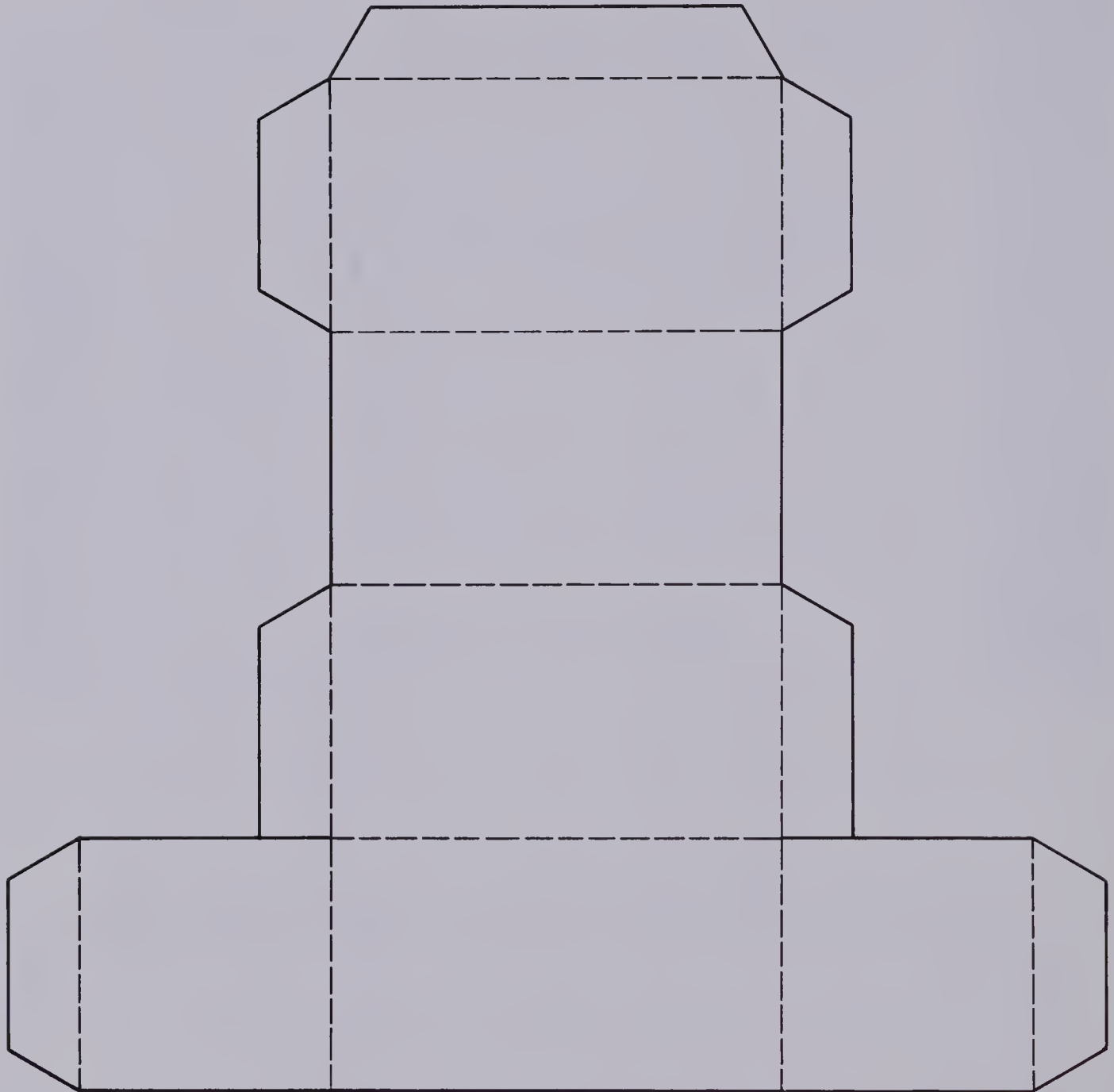
Lesson		Objective	Pages
Preview		Recognize the line of symmetry in symmetric objects and figures.	261
1	G1	Recognize and analyse cubes, cones, spheres, cylinders, and pyramids.	262-263
2	G2	Recognize and compare angles.	264-265
3	G3	Recognize and name parallel, intersecting, and perpendicular lines.	266-267
4	G4	Recognize rectangles, squares, and congruent rectangles.	268-269
5	G5	Recognize and classify triangles.	270-271
6	G6	Sort and classify plane figures.	272-273
7	G7	Recognize and demonstrate slides.	274-275
8	G8	Recognize and demonstrate flips.	276-277
9	G9	Recognize and investigate circumferences and centres of circles.	278-279
10	G10	Recognize and demonstrate turns.	280-281
Test		Geometry	282
Review		Multiplication and Division	283

# Cube

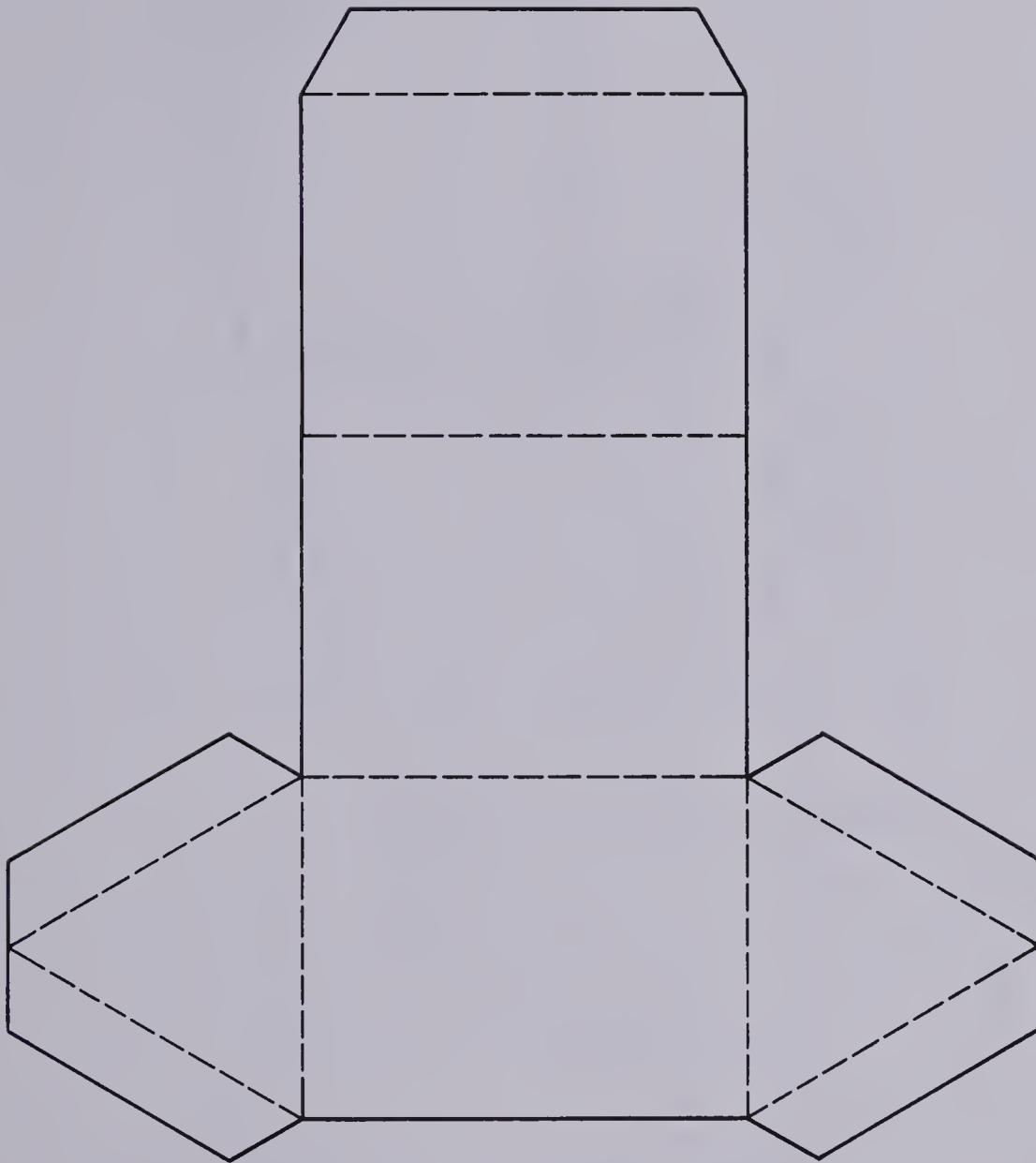




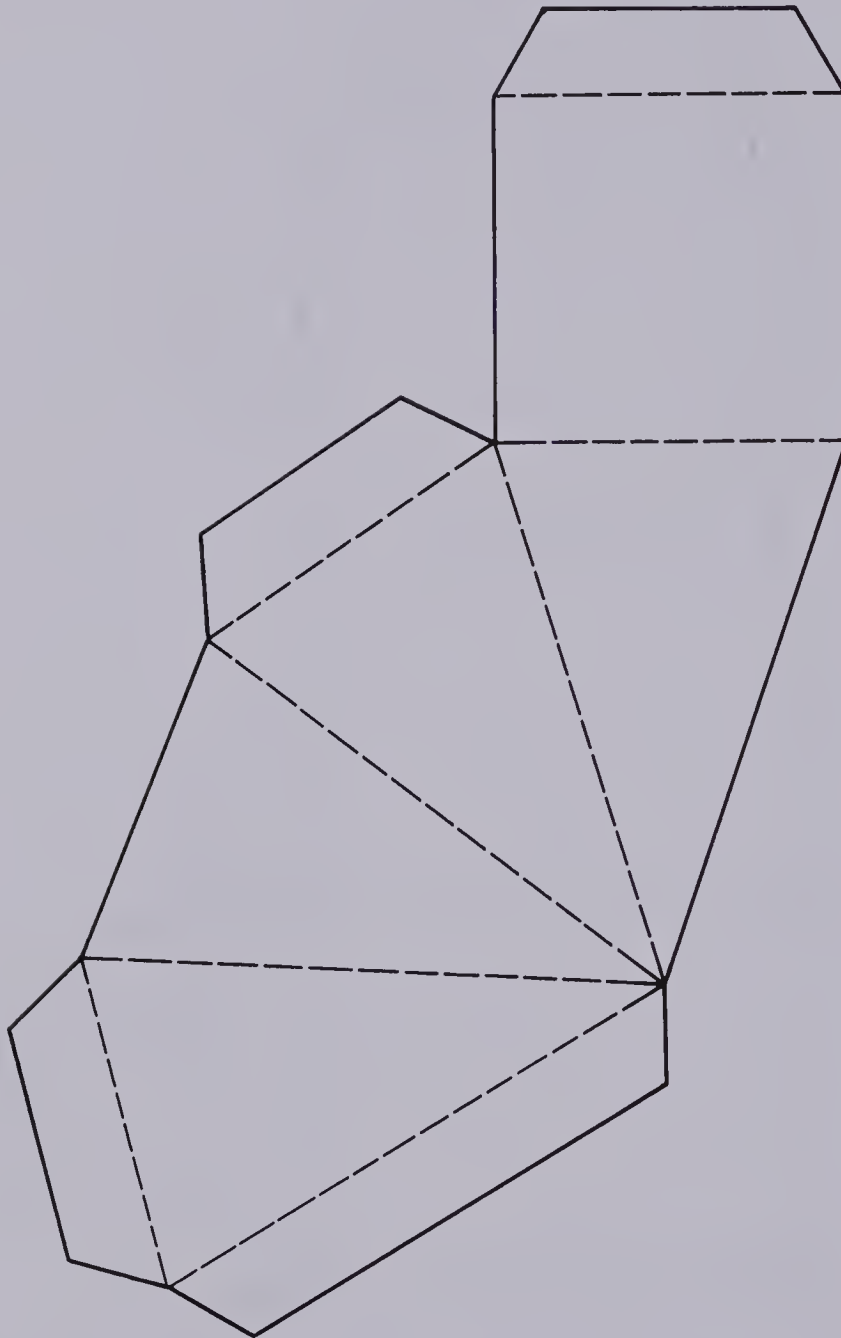
# Rectangular Prism



# Triangular Prism

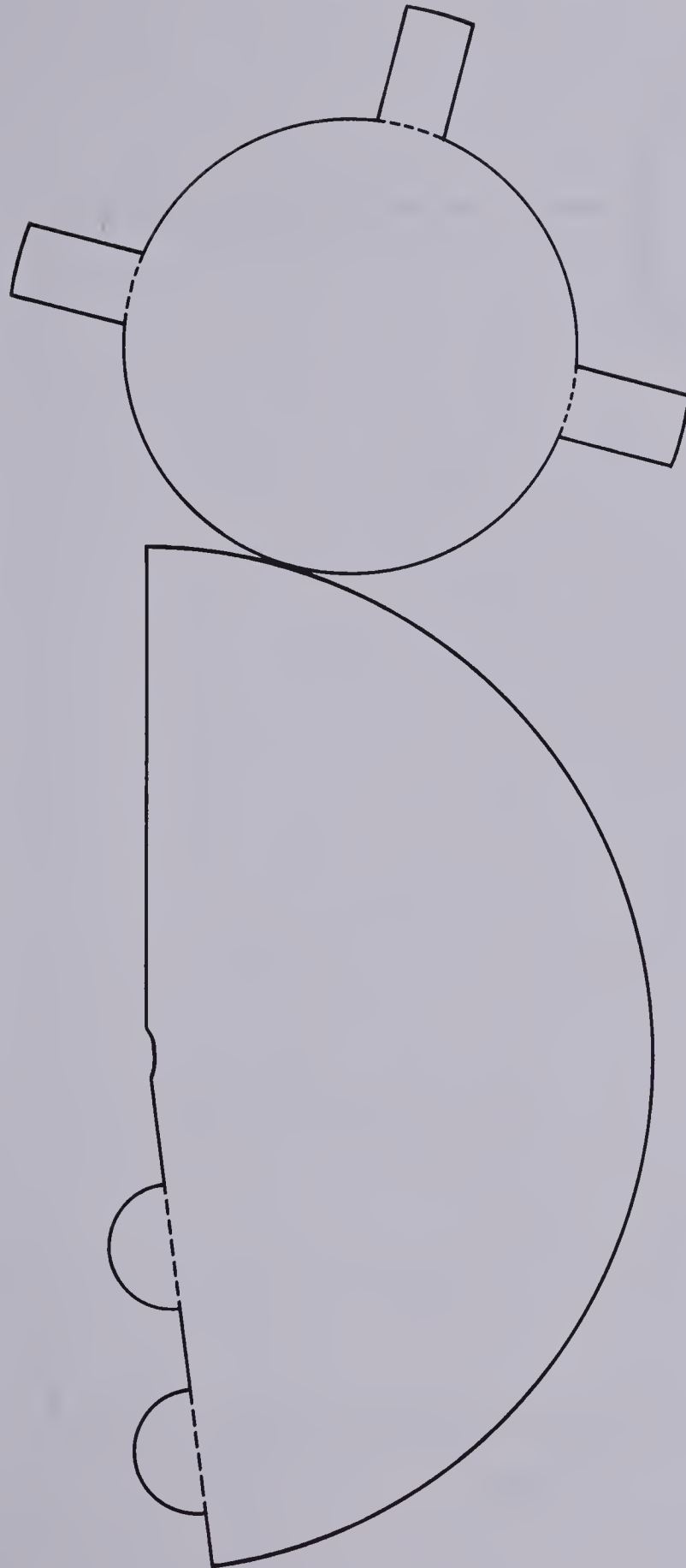


# Square-based Pyramid

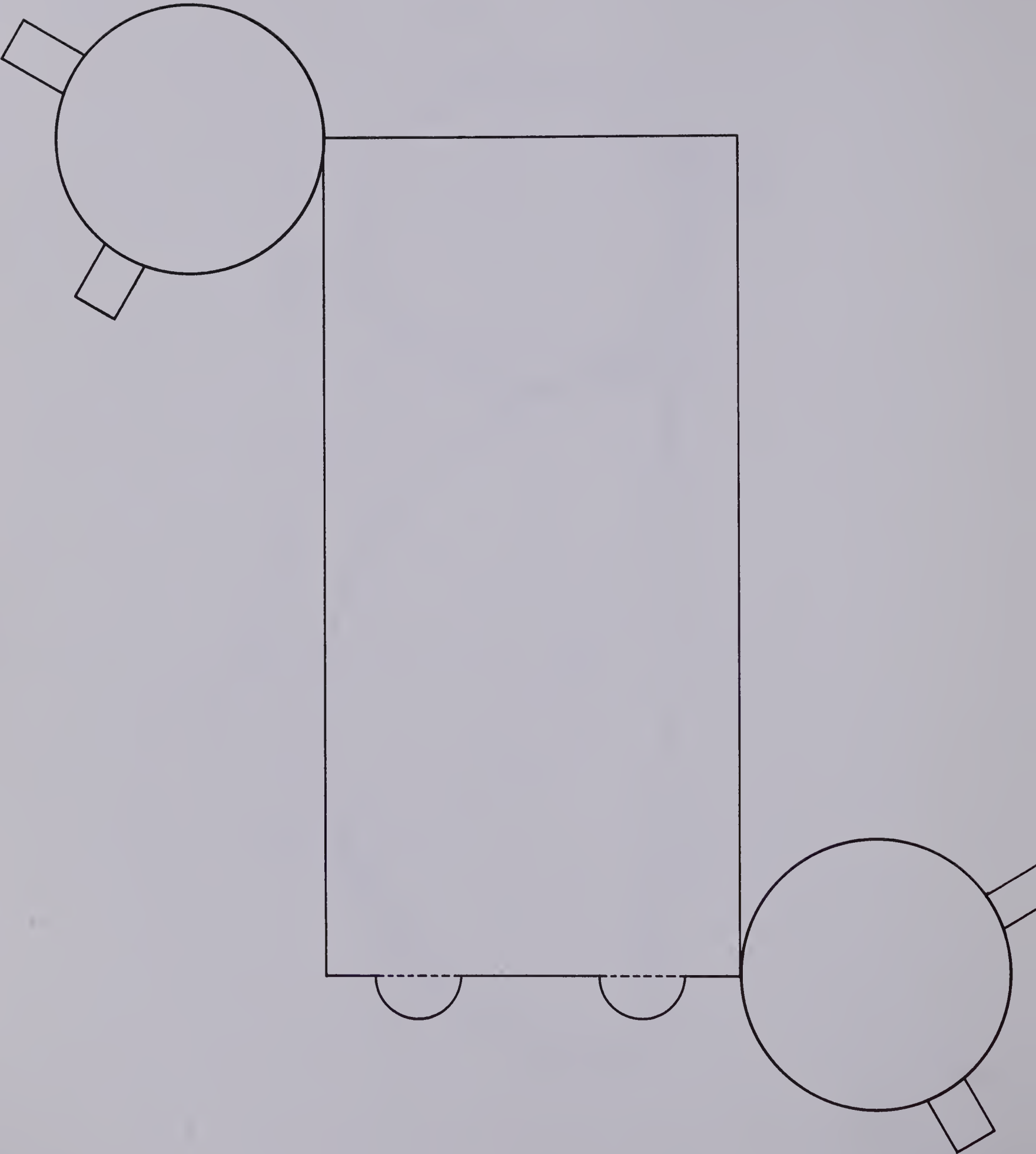




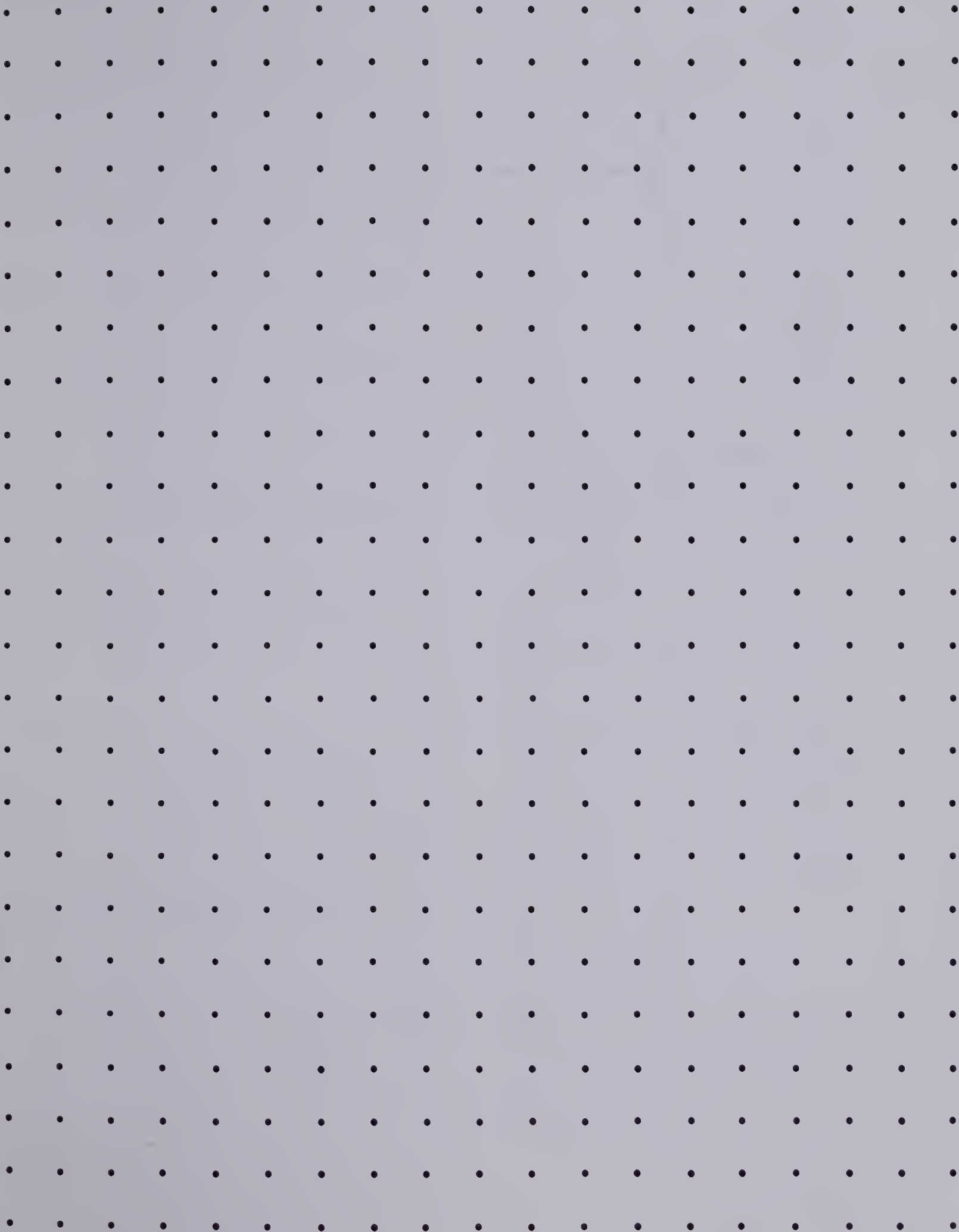
# Cone



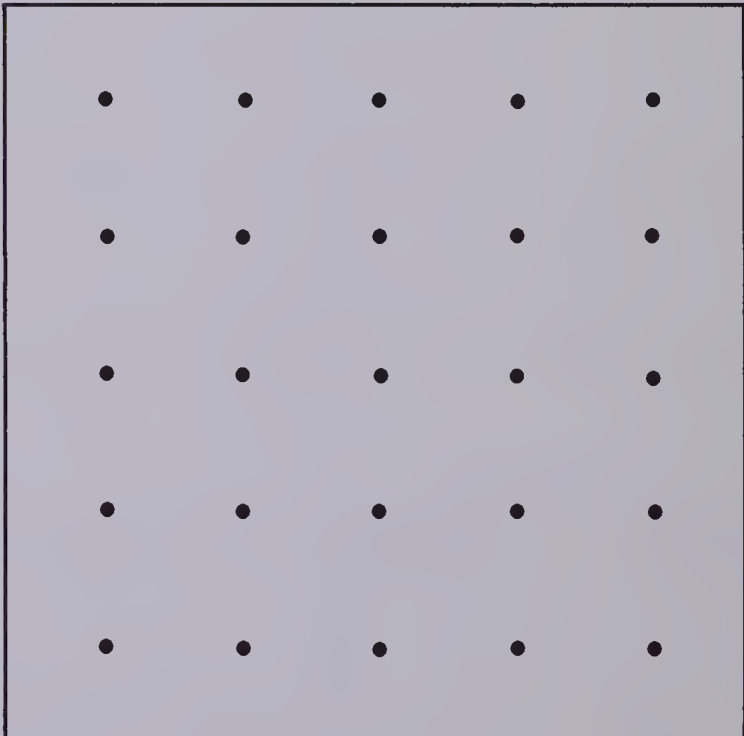
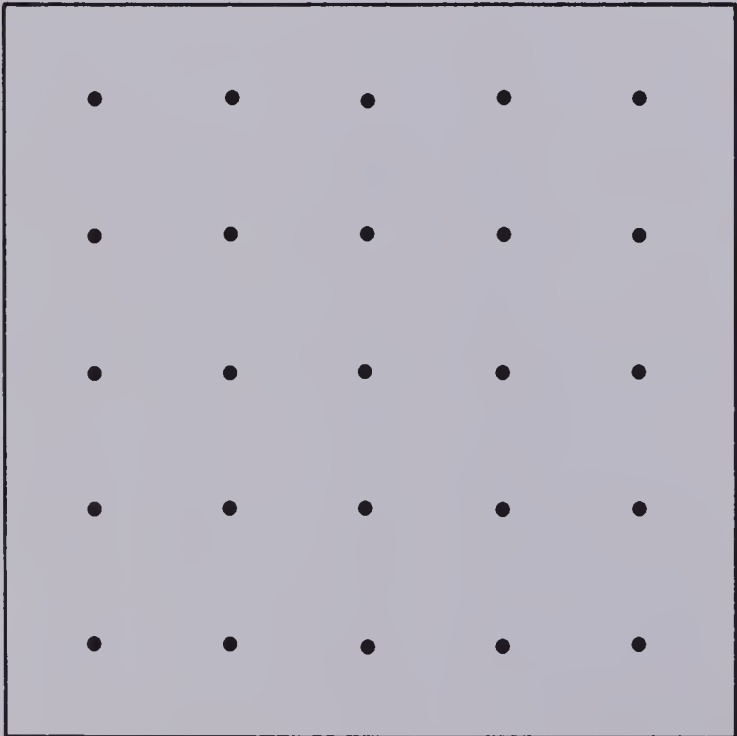
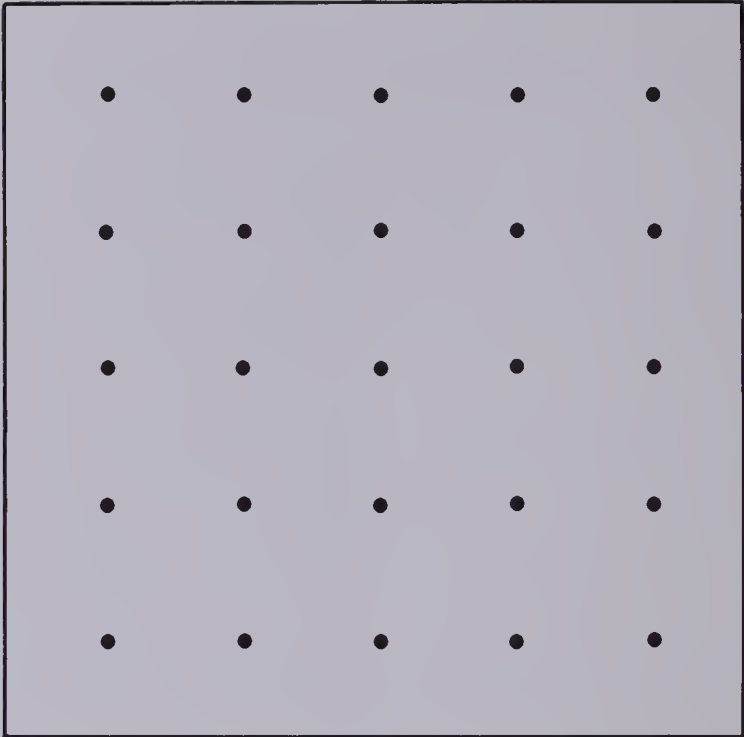
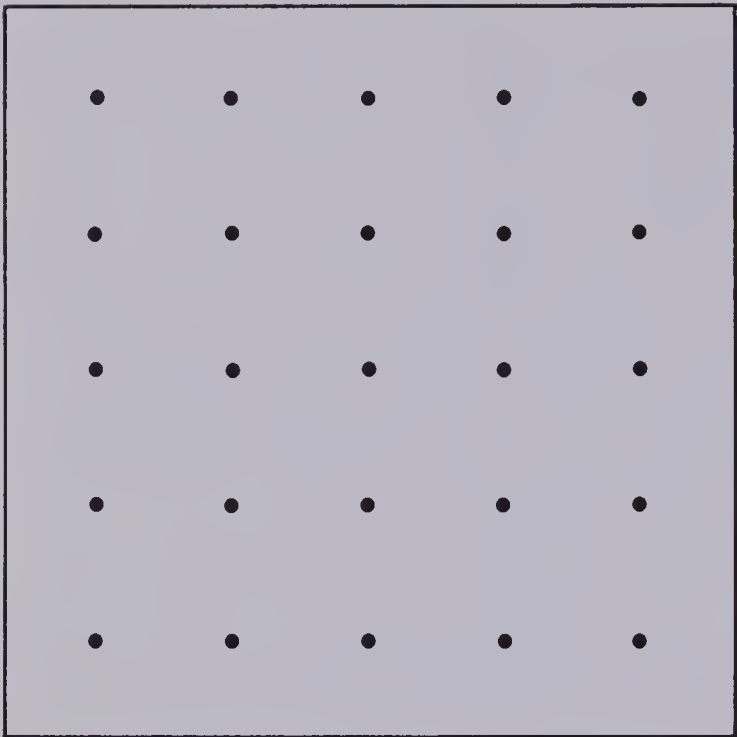
# Cylinder



# Dot Paper







# About This Unit

The instructional strategy is to develop geometric concepts and to introduce geometric terms using examples from the world in which the student lives. Lessons are introduced using concrete situations and previously learned skills. Newly acquired knowledge of geometry is used to help the student become aware of geometric figures in the environment.

Whenever possible, it is most beneficial to use concrete materials to introduce the ideas that are developed in the lesson example. Such work should *precede* use of the textbook, in addition to being used for teaching the textbook lesson and follow-up. In fact, unlike most computational lessons, a geometry lesson may take 2 or 3 days of classroom time and create more student involvement than is possible with a textbook page of computation.

With many classes it may be advisable to do the lessons in smaller sections at different times of the year, doing three-dimensional work at one time, plane figures at another time, and transformations later. December is a good time to do the three-dimensional shapes and constructions. Seasonal decorations can be made for the classroom. Valentine's Day is a good time to do symmetry, as is Spring when flowers are blooming and leaves are out.

## Ideas

Each lesson has its own series of new vocabulary. While it is not advisable to overload students with new words, a certain minimum vocabulary is unavoidable for communicating geometric concepts. New words should be introduced before each lesson. As the lesson develops, reference should be made to the written word so that the students become familiar with it.

The following word cards could be made for use in the lessons.

<b>Lesson 1</b>	
cube	face
cone	edge
sphere	vertex
cylinder	
pyramid	

<b>Lesson 2</b>
angle
right angle

<b>Lesson 3</b>
line
line segment
point
parallel
perpendicular
intersecting

<b>Lesson 5</b>
triangle

<b>Lesson 7</b>
flip

<b>Lesson 9</b>
circle
centre
circumference

<b>Lesson 4</b>
rectangle
square
congruent
quadrilateral

<b>Lesson 6</b>
polygon
pentagon
hexagon
octagon

<b>Lesson 8</b>
flip
flip line

<b>Lesson 10</b>
turn
turn arrow
turn centre

Check the resource booklets or contact the art department for suggestions on symmetry activities.

The following materials will be very helpful in completing this unit.

### Preview

tracing paper  
MIRA

### Lesson 1

a variety of solid shapes  
Plasticene  
straws  
marshmallows  
toothpicks  
poster paper  
ruler  
patterns  
overhead projector

### Lesson 2

worksheets with clock faces  
strips of cardboard  
paper fasteners  
markers  
ruler  
book of geostrips

### Lesson 3

pencils  
centimetre strips  
straws  
models or solids  
magazines

### Lesson 4

dot paper  
geoboards  
elastics  
cardboard  
paper  
tiles

**Lesson 5**  
triangles  
various shapes  
geoboards  
dot paper  
coloured paper  
cardboard strips

**Lesson 7**  
dot paper

**Lesson 9**  
worksheet  
variety of cylindrical  
objects  
cardboard  
compass  
tape measure  
thumb tack

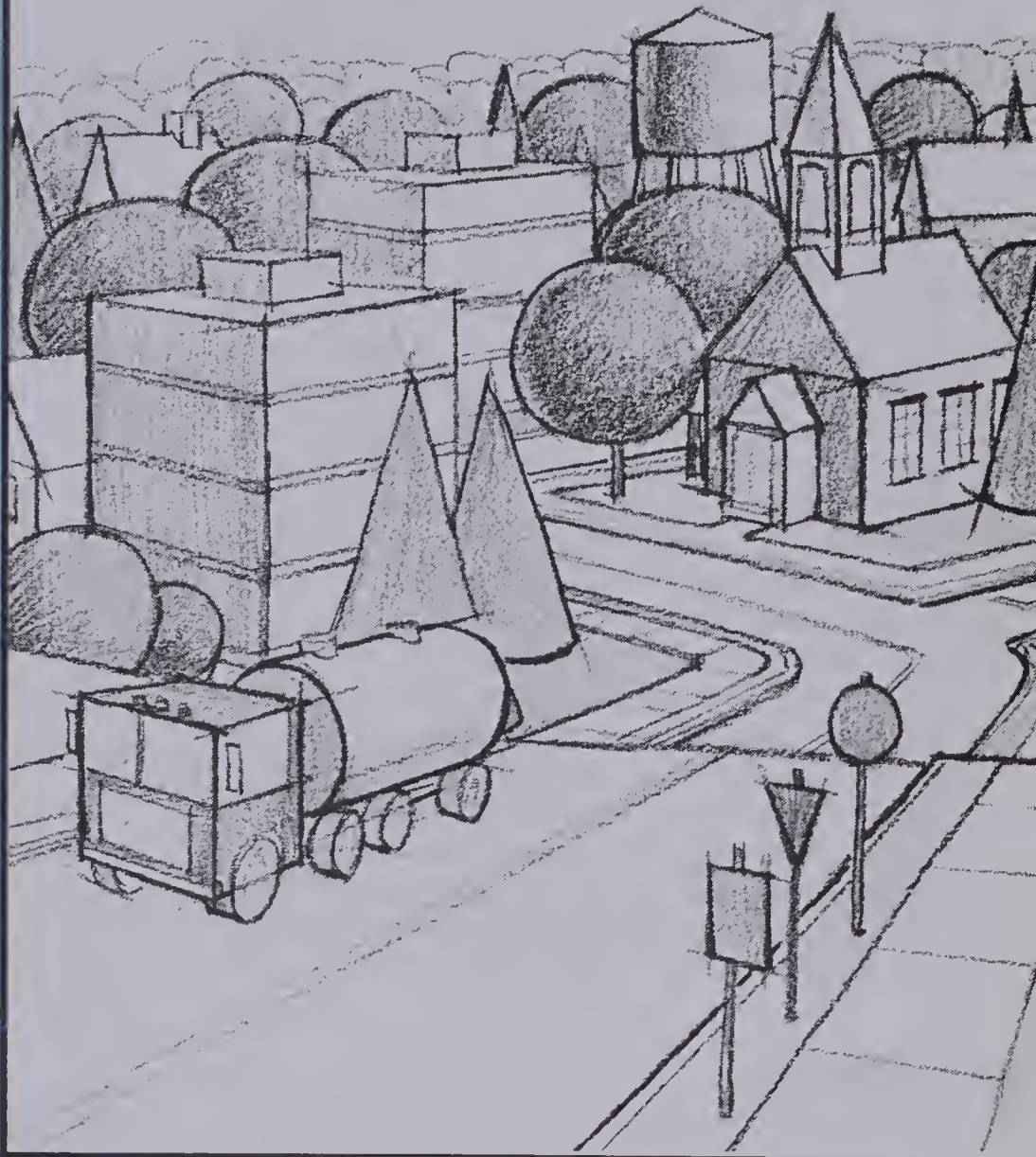
**Lesson 10**  
paper clip  
cardboard  
rectangle  
square  
right angle triangle

**Lesson 6**  
geoboard  
elastics  
dot paper  
paper

**Lesson 8**  
squared paper  
*MIRA* or mirror  
paint or ink

# UNIT 12

## GEOMETRY







Unit 12 Objectives	Test Questions	Pages
G1	1-4	262-263
G2	5-8	264-265
G3	9-12	266-267
G4	13-14	268-269
G5	15-16	270-271
G6	17-19	272-273
G7	20	274-275
G8	21, 22	276-277
G9	23	278-279
G10	24-26	280-281

### Pretest

Unit 12



Name the solid.

1.  cylinder
2.  cone
3.  cube
4.  sphere



Mark all the right angles.

5. 
6. 
7. 
8. 

Draw a line parallel to the given line.

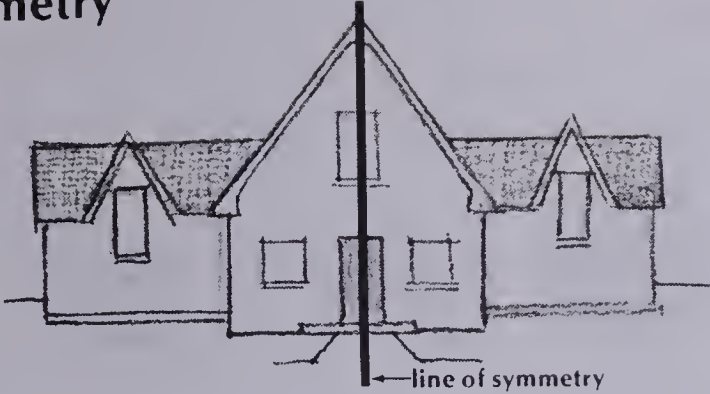
9. 
10. 

Draw a line perpendicular to the given line

11. 
12. 

Name each figure.





Is the object symmetric?

1.   
yes
2.   
yes
3.   
yes
4.   
no

Name each line of symmetry.

5.   
a, b
6.   
a
7.   
none
8.   
none
9.   
b
10.   
a, b

Suggestions

Review the terms “symmetry” and “line of symmetry”. Have the students seek out and name symmetric objects around them in the classroom, on the playground, and at home.

About the Page

The students should guess and test their answers by one or both of the following methods.

1. *Tracing paper.* Trace the figure; then either flip the tracing over and see if it still fits or fold the tracing on the line of symmetry and see if the halves match.
2. *MIRA.* Place the *MIRA* on the line of symmetry to see whether the halves coincide.

13.   
square

14.   
rectangle

15.   
triangle

16.   
right triangle

Draw a congruent figure.

17.

18.

19.

Draw the image.

20.   
slide →

21.   
flip →

22.   
flip →

Draw each.

23.   
a circle

24.   
image after  $\frac{1}{2}$  turn

25.   
image after  $\frac{1}{2}$  turn

26.   
image after  $\frac{1}{4}$  turn

## Objective G1

Recognize and analyse cubes, cones, spheres, cylinders, and pyramids.

## Introducing the Lesson

Review the words used to describe solids (faces, edges, vertices) through a discussion of various objects found in the students' environment: balls, containers, parts of a house. Talk about other flat and curved surfaces. Have the students explain why they think the object has a certain name. Review the descriptions of plane figures, such as circles, squares, rectangles, and triangles.

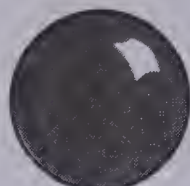
## Teaching the Lesson

If models of the solids are available, they should be used by the students. A demonstration model, at least, is essential. The nets provided in this *Teacher's Resource Book* may be reproduced and used to make models.

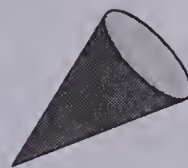
Discuss occurrences of various solids in the real world. Make lists with examples of each solid found in supermarkets, play equipment, around the home, workshop, or neighbourhood. Use the lesson example to introduce each type of solid. When a cube is shown, discuss its physical characteristics: 6 square faces, 12 edges, 8 vertices, etc. Discuss and note objects in and around the school that have the same shape as a cube. Then discuss some properties of cubes: won't roll, flat base, all flat faces, etc. Repeat this procedure for each of the solids in the lesson. Examine the drawings and explain that the broken lines are used to represent parts of the solid that cannot be seen directly. When a particular solid has been reviewed, have the students make the same solid from Plasticene or other suitable material. (See the Reinforcement section.)

## Solids

Solids have two kinds of surfaces: **curved surfaces** and **faces** (flat surfaces).



sphere



cone

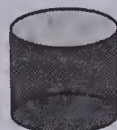


cube

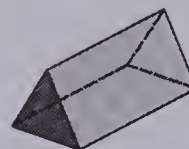
They may have **curved edges** or **straight edges**.



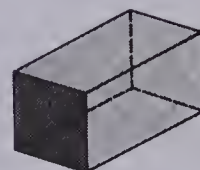
pyramid



cylinder



prism



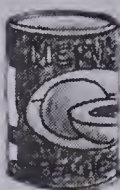
rectangular solid

Straight edges meet at a **vertex**.

## EXERCISES

What solid does each object suggest?

1.



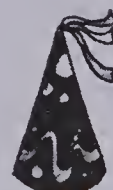
cylinder

2.



cube

3.



cone

4.



sphere









5. Name the solids that have faces. **cube, rectangular solids, prism, cylinder, cone, pyramid**
6. Name the solids that have curved edges. **cylinder, cone**
7. Name the solids that have no vertices. **sphere, cylinder**

## Using the Exercises

- Discuss the answers to questions 1 to 7 with the whole class. Demonstrate the answers with models if the students are having difficulties.

## PRACTICE

What solid does each object suggest?

1.  pyramid
2.  rectangular solid
3.  cylinder
4.  prism
5.  cube
6.  sphere
7.  cone
8.  cube

9. Which solids have both kinds of surfaces (curved and flat)?  
cylinder, cone
10. Which solids have only straight edges?  
cube, rectangular solid, prism, pyramid
11. I have one flat surface.  
I have one curved surface.  
I have one vertex.  
What am I? cone
12. I have no vertices.  
I have edges.  
What am I? cylinder

13. Complete the table for all seven solids.

name of solid	faces	edges	vertices
cube	8	12	8










## Making Faces

Imagine cutting through the middle of a cube or a sphere.

What would the cut side look like?

Here are drawings of 4 solids being cut.

Match the face of the cut piece to figure A, B, C, D, or E.

1.  C
  2.  D
  3.  A
  4.  B
- A  B  C  D  E 

263

## Assigning the Practice

Minimum: 1-12

Average: 1-13

Enriched: 1-13

## Reinforcement

1. Have the students work with a partner to perform this activity. Put 6 or 7 solid objects in a box. Without looking in the box, reach into the box and pick up an object. Do not look at it. Feel the object and describe it to your partner. Name it. Take the object out of the box to see if you are correct. Take turns.

2. Make a model of each solid. Use Plasticene and straws or pipe cleaners; or toothpicks and marshmallows.

3. Measure the parts of different solids, for example, a cube. Find the length and width of one face, the height of the cube, and so on.

4. Provide students with patterns for making models of the solids. Make the models from poster paper. Set up a classroom display.

5. Cut models of the various solids in different places. Discuss the face of the new surface.

6. Show faces of various solids on the overhead projector. Have students guess what shape the solid is.

## Enrichment

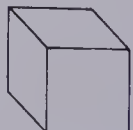
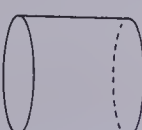

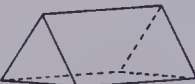

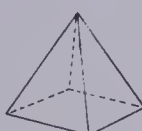
1. Assign *Making Faces* at the bottom of page 263. The cuts may be difficult for students to visualize. They should actually cut Plasticene or clay models.

2. On different sheets of poster paper write the name of each solid, for example, "a rectangular solid". Cut out pictures of many different solids and paste them on the poster paper under the correct name. Display the poster.

3. Have students cut out examples of geometric solids from pictures in magazines to create a bulletin board display.

## Extra Practice

Name the solid.

1.  cube
2.  cylinder
3.  cone
4.  prism
5.  sphere
6.  pyramid

## Worksheet G1

Pages 262-263



# UNIT 12 LESSON 2

## Objective G2

Recognize and compare angles.

### Introducing the Lesson

Ask the students to hold one hand in front of them, with the thumbs up and the palms toward their faces. Have them trace the V formed by the thumb and first finger. Call this figure an angle. Tell them to move the thumb closer to and farther from the finger to change the size of the angle. Other angles can be shown by tracing between the fingers. Discuss other familiar objects around the classroom that contain various sizes of angles.

### Teaching the Lesson

Use the lesson example to illustrate examples of angles. Although, mathematically, an angle should be drawn with arrows on the ends (to indicate rays continuing endlessly in one direction), students will encounter most angles in polygons or solid shapes and so they should be aware that line segments do form angles. Help the students to construct angle makers by fastening the ends of two strips of cardboard together with a shank fastener or snap fastener.

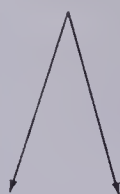
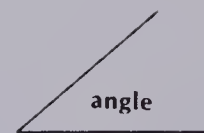
Discuss a right angle as a special angle that makes a square corner. Have the students use the corner of a piece of paper or a card to check the right angle in the example. A discussion on why the Leaning Tower of Pisa is famous may help to reinforce the idea of a right angle.

Make a right angle.

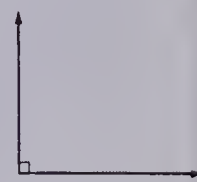
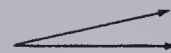
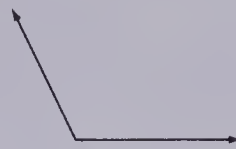
- Fold a piece of paper in about the middle. Crease it.
- Fold the paper again so that one part of the first crease fits onto the other part.
- Open the paper. The creases will make right angles.

## Angles

When two straight lines, segments, or rays meet, they form an **angle**



vertex



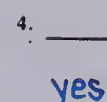
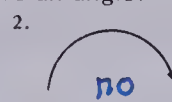
right angle

Lines or segments meet at a **vertex**

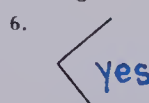
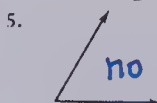
The arms of a **right angle** make a square corner.

### EXERCISES

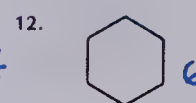
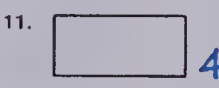
Does the figure have an angle?



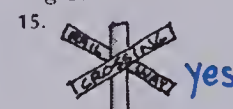
Does the figure have a right angle?



How many angles are there in each figure below?



Does the picture suggest at least one angle?



264

### Using the Exercises

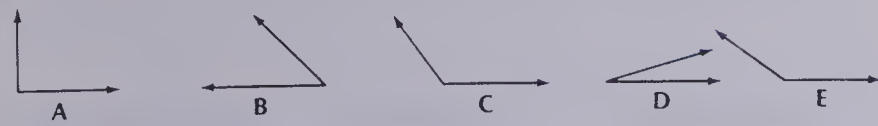
- Questions 1 to 4 require the students to recognize angles. If they answer yes to questions 2 or 3, discuss why these are not angles. *They are not straight line segments meeting at a vertex.*
- Questions 5 to 8 require recognition of a right angle. Students can test these by fitting the corner of a rectangular piece of paper over the angle.
- Questions 9 to 16 require recognition of angles formed in plane figures and in pictures of real objects.

## PRACTICE

How many angles are in each figure?

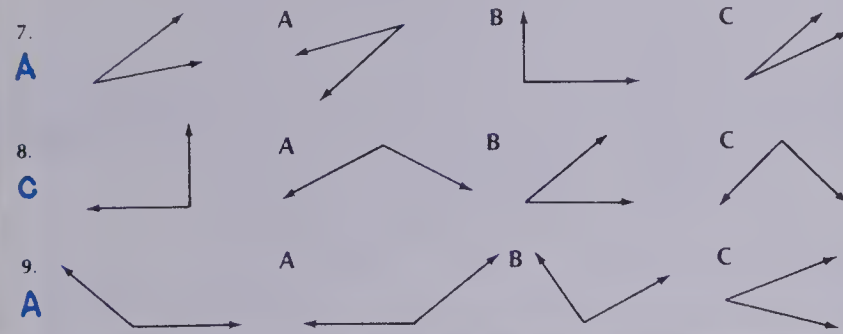


6. Name the angles in order from smallest to largest.



**small D, B, A, C, E large**

Write the letter of the angle that is the same size as the first angle



## Fancy Figures

Many numerals, geometric figures, and letters of the alphabet can be found in the diagram. How many of each kind can you find?

**Examples: 1, 2, 3, 4... Δ, □, □...  
A, B, C...**



265

## Assigning the Practice

Minimum: 1-9

Average: 1-9

Enriched: 1-9

## Reinforcement

1. *Fancy Figures*, on page 265, can be done by all students.

2. Use worksheets showing three clock faces with no hands. On the first clock face, draw in the hands of the clock so that they form a right angle. On the second clock face, show the hands making an angle smaller than a right angle. On the third clock face, show the hands making an angle larger than a right angle.

3. Make a collage of pictures. Use a felt marker and a ruler to mark the different angles you see in the collage.

## Enrichment

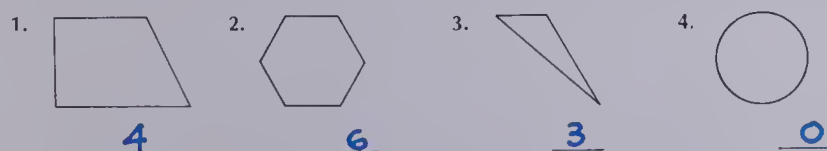
1. On plain paper, draw an angle of any size. Find a way to draw another angle that is the same size as the first angle. Explain how you made the second angle.

2. Ask students to find some flag signals (like the kind learned by Scouts) and indicate for which signals the arms form:  
a. a right angle.  
b. an angle smaller than a right angle.  
c. an angle larger than a right angle.

3. Check the library or ask the resource person in mathematics about a book on using geostrips. You will find many activities that can be done to reinforce learning about angles.

## Extra Practice

How many angles are in each figure?



5. Name the smallest angle. **B**



6. Use a square corner to identify the angles that are right angles



## Worksheet G2

Pages 264-265

# UNIT 12 LESSON 3

## Objective G3

Recognize and name parallel, intersecting, and perpendicular lines.

## Introducing the Lesson

Discuss with the students the use of the terms **line** and **line segment**. When we use the word **line**, we mean a straight line that extends endlessly in two directions. We place arrows at the ends of the segment to indicate this. A **line segment** extends only as far as it is drawn. Draw a line segment and part of a line on the board to illustrate the difference.

Ask the students to use two pencils and centimetre strips (or straws) and to place them on the desk so that they cross, or will cross if extended. Then ask the students to place the pencils on the desk so that they will never cross. (Use a ruler to line up the pencils.) Introduce the word **parallel**. Then have students place the pencils on the desk so they form a right angle. (Use a square corner to check.) Introduce the word **perpendicular**.

## Teaching the Lesson

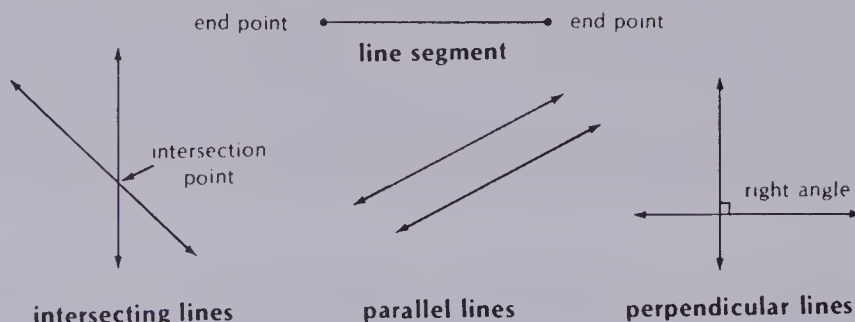
Use the lesson example to emphasize that a line is shown by placing an arrow at each end of a line segment. Discuss intersecting lines and note the different angles formed when lines intersect. On the chalkboard, draw two lines that do not show an intersection, but that would intersect if the segments were extended. Emphasize that lines are unending and that students may have to extend the illustration to see the intersection.

The parallel lines in the example will never meet even if extended.

A special case of intersecting lines occurs when the perpendicular lines meet at right angles. A small square is often drawn to indicate that the lines are perpendicular. (See the lesson example.)

Use models of solids and ask the students to find intersecting, parallel, and perpendicular segments.

# Lines, Segments, and Points



## EXERCISES

Tell whether the line segments are parallel, intersecting, or intersecting and perpendicular.

1. parallel
2. intersecting
3. parallel
4. intersecting and perpendicular

For each figure, name the parallel sides. Name the perpendicular sides.

5.   
 // a, c   
 // b, d   
 ⊥ a, b   
 ⊥ c, d   
 ⊥ a, d   
 ⊥ c, b
6.   
 // f, h
7.   
 // s, u   
 // r, t   
 ⊥ s, r   
 ⊥ s, t   
 ⊥ u, r   
 ⊥ u, t

Does the picture suggest parallel lines, intersecting lines, or perpendicular lines?

8. int.
9. parallel (⊥ int.)
10. perp.
11. perp.
12. perp.
13. parallel
14. all three

266

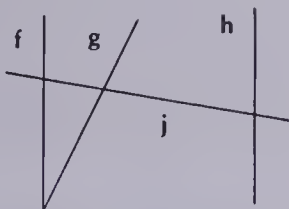
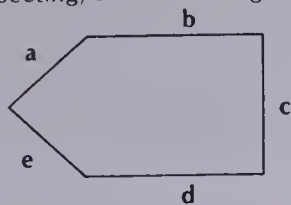
## Using the Exercises

- The exercises require the students to recognize and distinguish the differences among perpendicular, parallel, and intersecting lines.
- Work with the students on questions 5 to 7. They may not be familiar with methods of labelling lines. Point out that we give names to lines in order to refer to them more easily. In these cases, we are naming lines using small letters. The letter closest to each line is the name. So in question 5, line **a** is perpendicular to line **b**, and line **a** is parallel to line **c**, and so on.



## PRACTICE

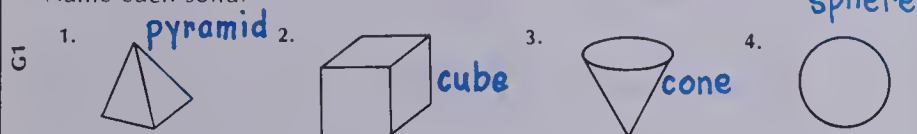
Tell whether each pair of line segments is parallel, intersecting, or intersecting and perpendicular.



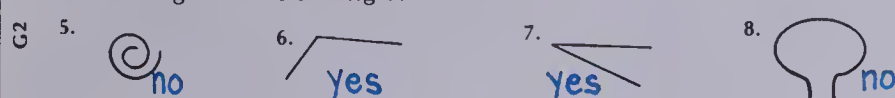
1. a and b **int.**
  2. b and c **perp.**
  3. c and d **perp.**
  4. b and d **para.**
  5. f and h **para.**
  6. g and j **int.**
  7. h and j **int.**
  8. f and g **int.**
9. Name three objects in your classroom that have pairs of parallel segments. **Answers will vary.**
10. Name objects in your classroom that have pairs of intersecting segments. Which also have perpendicular segments? **Answers will vary.**

## REVIEW

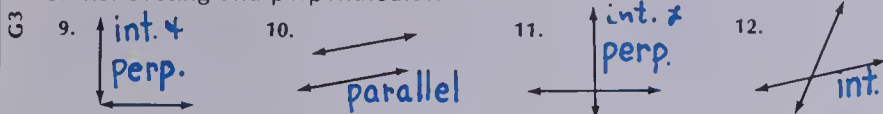
Name each solid.



Does the figure have an angle?



Tell whether each pair of lines is parallel, intersecting, or intersecting and perpendicular.



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## Assigning the Practice

Minimum: 1-10

Average: 1-10

Enriched: 1-10

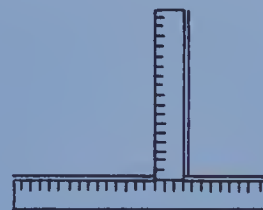
## Review Exercises

Questions	Objective	Pages
1-4	G1	262-263
5-8	G2	264-265
9-12	G3	266-267

## Reinforcement

1. Place a centimetre strip on a piece of plain paper. Draw a line segment along the top and bottom of the strip (not the ends). If the line segments were extended, would the lines ever meet or cross? Describe these segments.

2. Place a centimetre strip on a plain piece of paper. Draw a line segment along the top of the strip. Place the end of another centimetre strip against the top of the first strip. Draw a line segment along one side of the strip.



Use a corner of a piece of paper to measure the angle formed. Do the line segments meet at right angles? Describe these segments.

3. Make lists of things that represent parallel, perpendicular, and intersecting lines.

## Enrichment

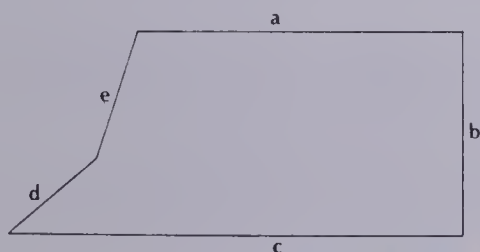
1. Challenge the students to give an example of two lines that are not parallel and do not intersect. (Skew lines in three-dimensional space.)

2. Have students bring in pictures from magazines to illustrate the lines discussed.

## Extra Practice

## Worksheet G3

Pages 266-267



1. Name two segments that intersect **a & c, a & b, d & c, d & e, a & e, b & c**
2. Name two other segments that intersect. \_\_\_\_\_
3. Name two segments that are parallel. **a & c**
4. Name two segments that are perpendicular. **a & b or b & c**
5. Name two segments that would intersect if extended. **e & b**

# UNIT 12 LESSON 4

## Objective G4

Recognize rectangles, squares, and congruent rectangles.

## Introducing the Lesson

Draw 2 four-sided figures on the chalkboard. Make one irregular and one a rectangle. Ask the students to tell ways in which the figures are the same (4 sides, 4 angles) and ways they are different. *A rectangle has pairs of parallel sides of equal length, and square corners.* Draw a rectangle and a square on the chalkboard. Ask the students to tell how they are the same (4 sides, 4 angles, 4 square corners, etc.) and how they are different. *The square has all sides of equal length.*

## Teaching the Lesson

Use the lesson example to examine a set of special quadrilaterals called **rectangles**. Discuss the properties of a rectangle. Ask the students to indicate some objects in the classroom that have rectangular forms or faces. Use the lesson example to examine a special set of rectangles called **squares**. Discuss the fact that a square is a special type of rectangle. Discuss the special property of a square that distinguishes it from a rectangle. Ask students to cite objects in the classroom that have at least one square face.

Emphasize:

All squares are rectangles.

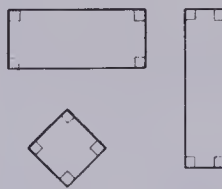
All rectangles are 4-sided figures.

Use the lesson example to introduce the term **congruent**: *same size and same shape*. Draw pairs of figures on the chalkboard and ask the students to identify pairs of congruent figures. Have them test their answers by tracing one figure and trying to fit the tracing over the other. If they fit exactly, then the original figures are congruent.

## Rectangles and Squares

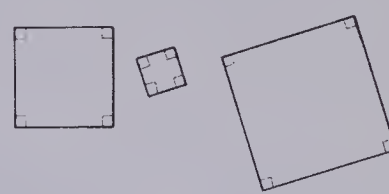
rectangle

4 sides, 4 right angles

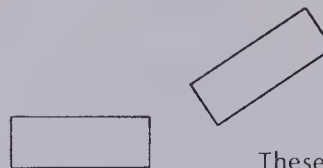


square

a rectangle with all sides equal



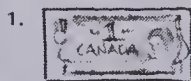
**Congruent** figures have the same size and shape.



These rectangles are congruent.

## EXERCISES

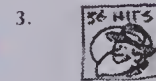
What figure does each picture suggest?



rectangle



square



square



rectangle



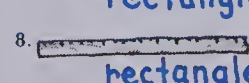
rectangle



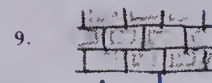
square



square



rectangle

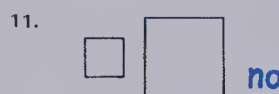


rectangle

Are these figures congruent?



yes



no



yes

13. Is every square also a rectangle? **yes**

14. Is every rectangle also a square? **no**





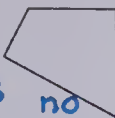
268

## Using the Exercises

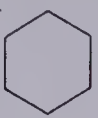
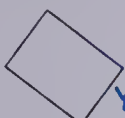
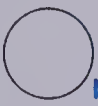

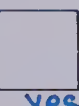
- Questions 1 to 9 require recognition of basic figures in real-world objects.
- Questions 10 to 12 require an understanding of congruence. While the figures in question 11 are the same shape, they are different in size and, therefore, not congruent.
- Questions 13 and 14 require an understanding of the definitions. Students having difficulty should work with and discuss concrete shapes.

## PRACTICE













Is the figure a square?

1.  **yes**
2.  **no**
3.  **no**
4.  **yes**
5.  **no**

Is the figure a rectangle?

6.  **no**
7.  **yes**
8.  **no**
9.  **yes**
10.  **yes**

Which figure (A, B, or C) is congruent to the first figure?

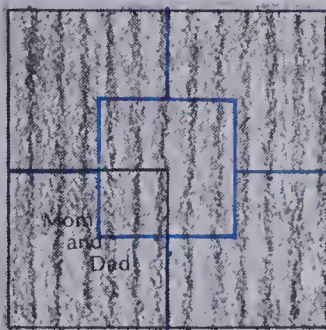
11. **A**  A  B  C 
12. **C**  A  B  C 
13. **B**  A  B  C 

14. How many lines of symmetry does a square have? **4**
15. How many lines of symmetry does a rectangle have? **2**

## Square in a Square

A family garden is square.  
The mother and father keep one quarter  
of the garden for themselves.  
Divide the rest of the land so that each  
of their 4 children gets an equal part.

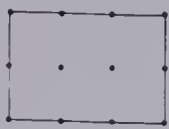



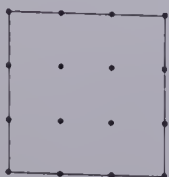
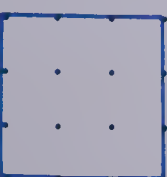


Note: If you want to move Mom and  
Dad's square, you may.



269

## Extra Practice

Draw a figure congruent to the first one

1.  
2.  
3.  
4.  

## Worksheet G4

Pages 268-269

## Assigning the Practice

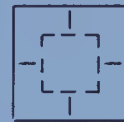
Minimum: 1-13

Average: 1-14

Enriched: 1-15

## Reinforcement

1. Cut two pieces of cardboard as shown.



Put the pieces from each in different envelopes. Ask students to fit the pieces in each envelope together as a square.

2. Ask the students to draw a picture that consists of only rectangles and squares.

3. Draw a large rectangle or square on a piece of paper. Cut the figure into 4 or 5 parts of different sizes and shapes. Put the pieces in an envelope and mark the envelope "square" or "rectangle". Exchange envelopes with another student. Can you put the pieces together to make the figure named?

4. Have the students make a tiling pattern using both square tiles and rectangular tiles.

5. Make lists of objects in the school that have at least one square face; at least one rectangular face; at least one face of each shape; and so on.

## Enrichment

1. Assign *Square in a Square* on page 269.

2. Discuss the following.

- a. All rectangles are 4-sided.
- b. All 4-sided figures are rectangles.

3. Using a large geoboard and elastics, have the students make a series of squares and rectangles. Provide dot paper (the same as geoboards). Students reproduce geoboard pictures onto dot paper. Save the better pictures. Mount and laminate them to make activity cards. Put them out at a later date. Students will then produce, on a geoboard, the pictures represented on the cards.



# UNIT 12 LESSON 5

## Objective G5

Recognize and classify triangles.

### Introducing the Lesson

Draw two squares, two rectangles, and a triangle on the board. Ask the students to identify the one figure that is different from all the others and to indicate how it is different.

A figure is *closed* if it has an inside and an outside. Closed figures with three sides are called **triangles**. You may use this opportunity to review rectangles and squares and their properties. Ask the students to draw two or three triangles by drawing closed figures with three sides.

### Teaching the Lesson

Ask students to check the figures they have drawn with those shown in the lesson example. A triangle has three sides and three angles. Use geoboards or dot paper. Ask the students to make a triangle with each side a different length. Then ask them to make a triangle that has two equal sides. Discuss ways of checking to see if two sides are equal (measure, use tracing paper, count pegs or dots, etc.). Remind students that a diagonal distance between pegs or dots is not the same as a horizontal or vertical distance. A triangle with three equal sides cannot be made using a square geoboard. Use the lesson example to illustrate each kind of triangle. Point out the markings used to indicate when sides are equal.

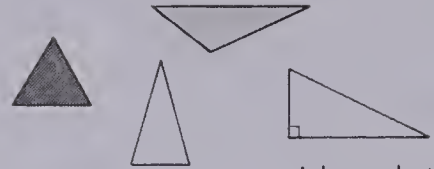
If possible, the students should have geoboards and the teacher should have a clear, plastic geoboard of the same size to use with an overhead projector.

Review the meaning of **congruence**. Draw several pairs of triangles on the chalkboard and ask students to identify which pairs are congruent.

## Triangles

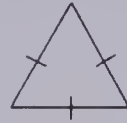
triangle

3 sides, 3 angles



right angle triangle

Triangles can have sides of equal length.



3 equal sides



2 equal sides

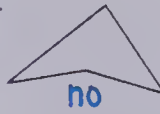


No equal sides

### EXERCISES

Is the figure a triangle?

1.



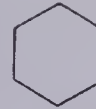
no

2.



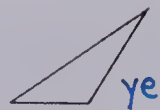
yes

3.



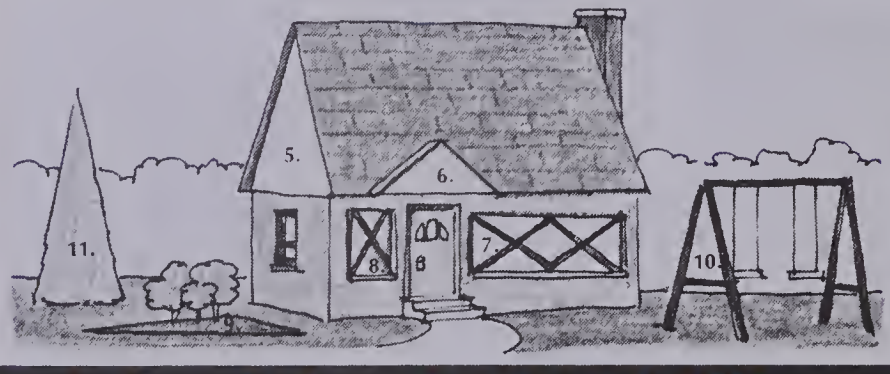
no

4.



yes

How many equal sides does each triangle below have?



270

5. 2  
6. 2

7. 3  
8. 2

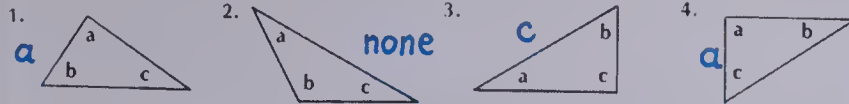
9. no equal sides  
10. 2  
11. 2

### Using the Exercises

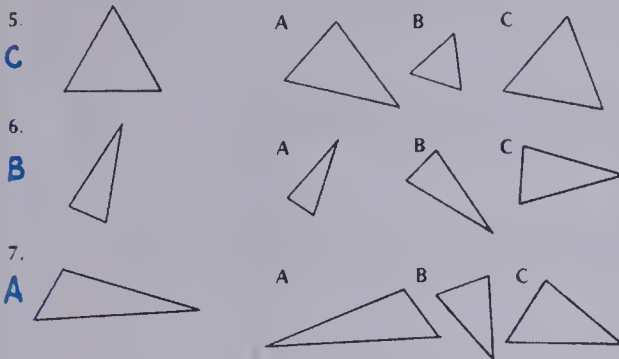
- Questions 1 to 4 require basic understanding of the definition of a triangle.
- Questions 5 to 11 require recognition of triangles in the real world as well as recognition of the properties of the triangles. If students are giving incorrect answers, make sure they have identified the correct triangle to be associated with each question.

Which angle is a right angle?

Use the corner of a piece of paper to check your answer.



Which triangle (A, B, or C) is congruent to the first triangle?



How many lines of symmetry does each triangle have?



## Triangle Tracer

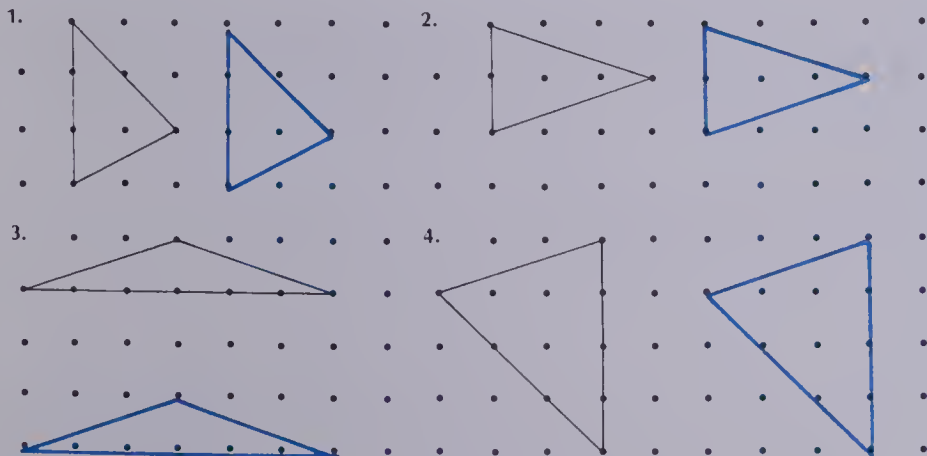
Can you find 16 triangles in this figure?



271

## Extra Practice

Draw a triangle congruent to the first one.



## Worksheet G5

Pages 270-271

## Assigning the Practice

Minimum: 1-10

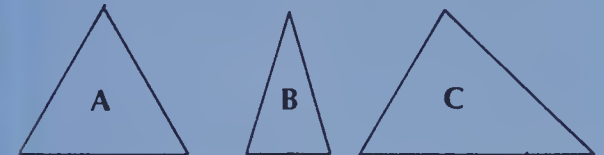
Average: 1-10

Enriched: 1-10

## Reinforcement

1. All students may try *Triangle Tracer* on page 271. Have them copy the figure using tracing paper and work with the tracing.

2. Distribute sheets with large drawings of triangles with three equal sides, two equal sides, and no equal sides.



Tell students to cut off the corners of a triangle and compare the sizes of the angles. They are to record the findings for each triangle.

3. Ask the students to draw and cut out a triangle of any size. They are to cut out another triangle the same size and shape as the first triangle. Ask, "How many different shapes can you make by putting the two triangles together to make one new shape? Trace the shapes as you make them."



4. Have the students cut out three strips of cardboard, one 6 cm long, one 2 cm long, and one 3 cm long. Ask them to make a triangle using the strips. Discuss why a triangle cannot be made.

5. Have the students make a picture using only triangles of different sizes, shapes, and colours that they have cut from construction paper.

## Enrichment

1. Fold a piece of plain paper randomly several times. Open it. Colour any triangles blue, squares red, and other rectangles yellow.

2. Have the students fold paper to try to make the different kinds of triangles.

## Objective G6

Sort and classify plane figures.

### Introducing the Lesson

The students should make the following figures on geoboards or dot paper and discuss their properties: triangle, square, rectangle, and other four-sided figures. Have the students make a five-sided figure. Write the name **pentagon** on the board. Discuss the number of sides and the number of angles in the figure. Repeat the procedure for a **hexagon** and an **octagon**.

Introduce the word **polygon** as the term for all of the above figures. Point out that triangles, rectangles, and squares are all polygons. Polygons are closed and have sides that are straight line segments. Draw these figures on the board. Ask why they are *not* polygons.

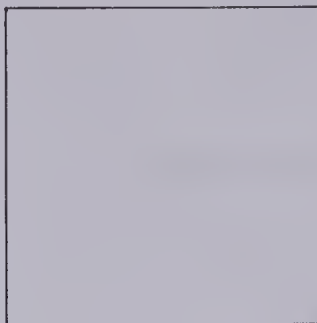


### Teaching the Lesson

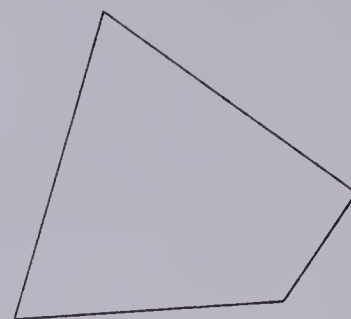
Ask the students to make a square on the geoboard or on dot paper. Emphasize that the square has four equal sides and four equal angles (right angles). Introduce the term **regular polygon** for a polygon with all sides the same length and all angles the same size. Use different-coloured elastics (or lines) to mark each line of symmetry. Ask the students to draw and cut out (you may wish to supply the pattern) a triangle with three equal sides and three equal angles. Have them find all the lines of symmetry by folding the triangle.

## Polygons

square



4 equal sides  
4 equal angles  
4 lines of symmetry



4 sides  
4 angles  
No lines of symmetry

### EXERCISES

Copy and complete this chart for the figures below.

Number	Name	Number of Sides	Number of Angles	Number of Equal Sides	Number of Lines of Symmetry
1.	triangle	3	3	3	3
2.	triangle	3	3	0	0

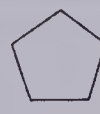
1.



2.



3.



pentagon

4.



pentagon

5.



hexagon

6.



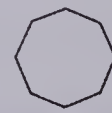
hexagon

7.



octagon

8.



octagon

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### Using the Exercises

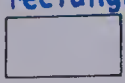

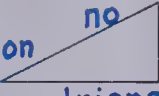

- The exercises may take up the entire lesson. The Practice and Review may be assigned in the next math period. This may be done as a board exercise. You (or a student) can draw the chart on the board and complete it with the whole class. However, at the conclusion of the exercises, students should draw and label each polygon in their notebooks. Otherwise, they will quickly forget them.
- Review the names from their workbooks before assigning the Practice on the second day.















## PRACTICE

Does the figure have all sides equal?

Name each figure.

1.  **rectangle**  
no
2.  **yes**
3.  **no**  
**triangle**
4.  **square**  
**yes**


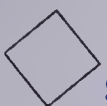


Which figure (A, B, or C) is congruent to the first figure?

5.  **C**
  6.  **B**
  7.  **A**
- A  B  C 
- A  B  C 
- A  B  C 





## REVIEW

Write S if the figure is a square.

Write R if the figure is a rectangle and not a square.

- G4
1.  **R**
  2.  **S**
  3.  **R**
  4.  **S**

Is the figure a triangle? Write yes or no for each.

- G5
5.  **no**
  6.  **no**
  7.  **yes**
  8.  **yes**

G6 How many sides do these polygons have?

9. pentagon **5**
10. hexagon **6**
11. octagon **8**

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## Assigning the Practice

Minimum: 1-7

Average: 1-7

Enriched: 1-7

## Review Exercises

Questions	Objective	Pages
1-4	G4	268-269
5-8	G5	270-271
9-11	G6	272-273

## Reinforcement

1. Distribute worksheets having diagrams of an isosceles triangle, equilateral triangle, square, rectangle, regular pentagon, hexagon, and octagon. Ask the students to draw all the lines of symmetry of each figure. If necessary, have them trace and cut out each figure, then fold and crease it to find the lines of symmetry.

2. Use straws of equal lengths to make a triangle, a square, a regular pentagon, a regular hexagon, and a regular octagon. Thread the straws on pipe cleaners to form the figures.

3. Use a set of polygons that can be sorted by colour, size, shape, regular or irregular. Sort the shapes in as many different ways as possible. Record each group and the attribute of the grouping.

4. Make a booklet showing different polygons. Include pictures from magazines and newspapers that illustrate each type of polygon.

## Enrichment

Fill in the blank with *all* or *some*.

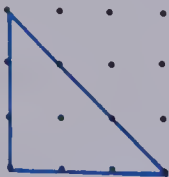
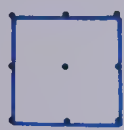
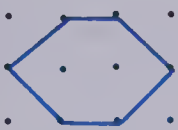
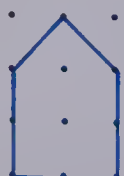
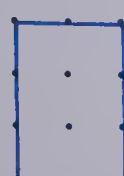

- \_\_\_\_\_ squares are rectangles.
- \_\_\_\_\_ rectangles are squares.
- \_\_\_\_\_ rectangles are quadrilaterals.
- \_\_\_\_\_ squares are quadrilaterals.
- \_\_\_\_\_ quadrilaterals are squares.
- \_\_\_\_\_ polygons are quadrilaterals.
- \_\_\_\_\_ quadrilaterals are polygons.

## Extra Practice

## Worksheet G6

Pages 272-273

Draw each figure.

1.  **triangle**
2.  **square**
3.  **hexagon**
4.  **pentagon**
5.  **rectangle**
6.  **octagon**

## Objective G7

Recognize and demonstrate slides.

## Introducing the Lesson

Discuss the word **slide**. Define sliding as travelling in a straight line without turning. Ask students to name examples of things that slide (sliding doors, drawers, car windows, any moving vehicle, ...).

## Teaching the Lesson

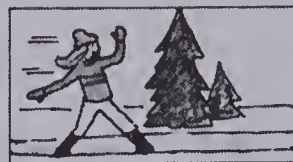
Discuss the picture at the top of page 274. Frames 2 and 3 show the girl in two different positions. Note the position of the trees in the background. The girl *slides* along the ice.

Using dot paper, have the students draw a polygon. Make a tracing of it and slide the tracing along the dot paper. Have them copy the *image* of the polygon on the dot paper after the slide. The tracing shows that the two polygons, the original and its image, have the same size and shape. What is another way of saying this? *They are congruent*.

Have the students practise drawing slide images of several figures using dot paper.

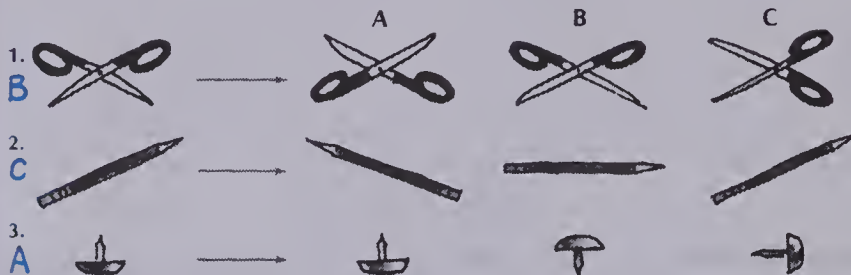
## Slides

The girl **slides** across the ice.

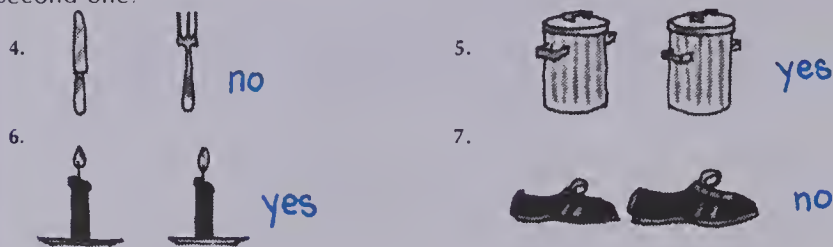


### EXERCISES

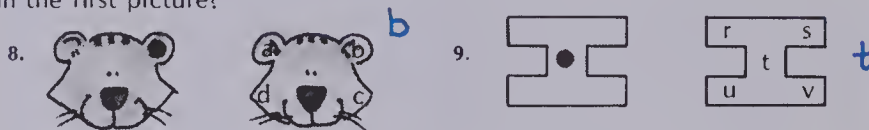
Which picture (A, B, or C) shows the first object after a slide?



Are the objects congruent? Trace the first one and **slide** it over the second one.



Which letter is in the same place in the second picture as the red dot in the first picture?



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## Using the Exercises

- In questions 1 to 3, if students cannot recognize the slide image immediately, have them make tracings and slide the tracing across the page to test each possible image. Remember! The tracings cannot be turned.
- Questions 4 to 7 review the concept of congruence and relate it to slides.
- Questions 8 and 9 ascertain readiness for identifying corresponding parts (vertices, sides, and angles) of congruent figures. This type of question becomes important when flips and turns have been studied.

## PRACTICE

Which pictures show slides?

1.



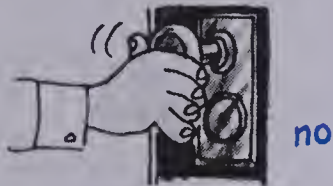
yes

2.



no

3.



no

4.



yes

Are the objects congruent? Trace the first one and slide it over the second one.

5.



no

6.



yes

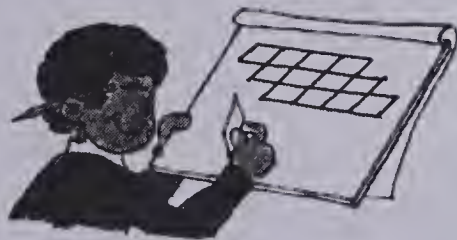
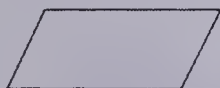
7.



yes

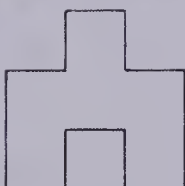
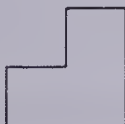
## Tiling

Trace this figure.



Make a pattern using slides.

Make other patterns with these figures.



275

## Assigning the Practice

Minimum: 1-7

Average: 1-7

Enriched: 1-7

## Reinforcement

1. All students can try *Tiling* at the bottom of page 275. They can colour their patterns to make poster displays.

2. Ask the students to find other examples of patterns that suggest slides of figures (wallpaper patterns, fabric patterns, rugs and floor tiles, art, etc.).

## Enrichment

Challenge students to draw other figures that will make patterns. They may use dot paper to guide them. Don't force them to use slides, but leave any discussion of turns and flips to the next lesson.

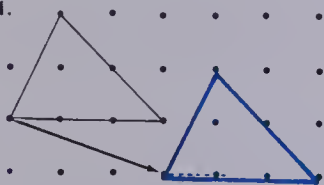
## Extra Practice

## Worksheet G7

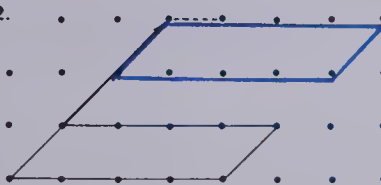
Pages 274-275

Complete each slide image

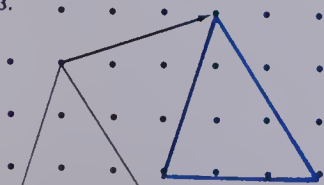
1.



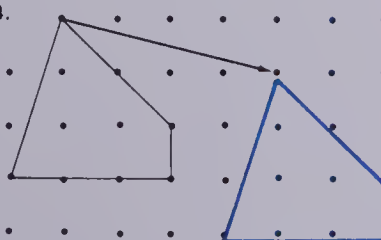
2.



3.



4.





## Objective G8

Recognize and demonstrate flips.

### Introducing the Lesson

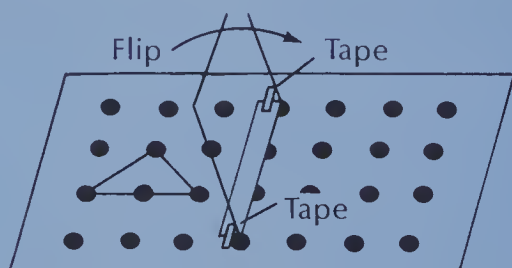
Review the concept of symmetry and the idea that if a figure has a line of symmetry, half of the figure can be folded over onto the other half. The line of symmetry divides the figure into two congruent halves. Introduce the flip by having students put both hands flat on their desks, palms up. The size and shape of both hands are the same. But you cannot fit one hand over the other by a slide. However, if you flip one hand over, it will then cover the other hand.

### Teaching the Lesson

Use the lesson example to demonstrate the flip. The figure does not change size or shape, but it does change position. Have each student cut out a polygon. They place the figures on the edges of their desks and flip them. Discuss the changes. Put an X somewhere on the object and flip again. Discuss the new position of the X. Discuss the fact that the figures before and after the flip are congruent: they do not change size or shape.

Give students a sheet of dot paper and have them draw a figure and trace it. Have them flip the tracing and copy the *image* on the dot paper.

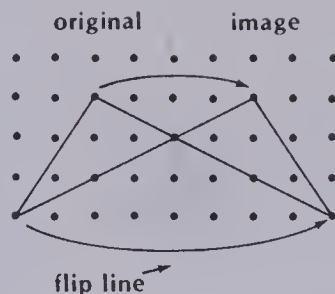
Repeat this procedure, but first have them draw a line on the dot paper and on the tracing. Fold the tracing along the line and tape it to the dot paper so that the two lines coincide.



The line is called the **flip line**. Measure the distance of corresponding points from the flip line. Discover that they are all equal distances from the line.

Alternatively, use a *MIRA* to perform the above exercises.

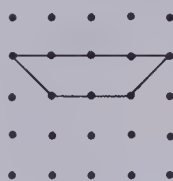
## Flips



### EXERCISES

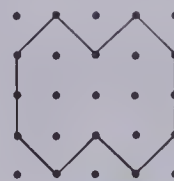
Does the picture suggest a flip?

1.



yes

2.



yes

3.



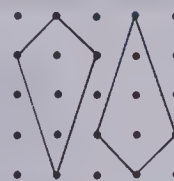
no

4.



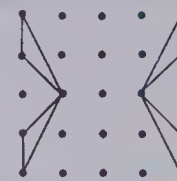
yes

5.



no

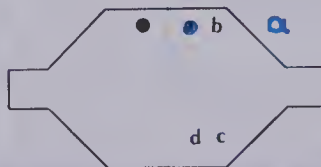
6.



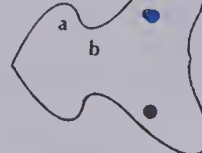
yes

Tell where the black dot will be after each flip.

7.



8.



9.

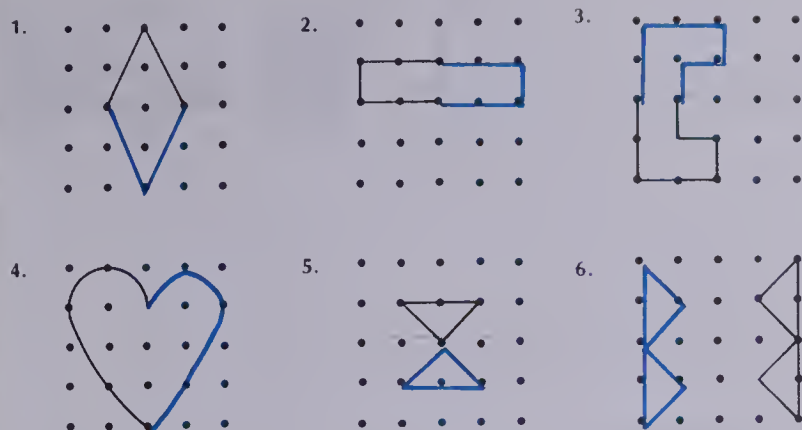


### Using the Exercises

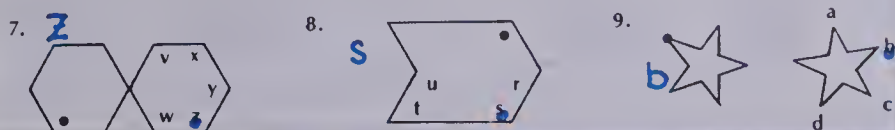
- Questions 1 to 6 can be checked using tracings or a *MIRA*.
- Questions 7 to 9 can also be checked with tracings or *MIRA*. These questions provide practice in regrouping corresponding positions in objects and images.

## PRACTICE

Copy the picture and the flip line. Finish the picture by completing the flip.

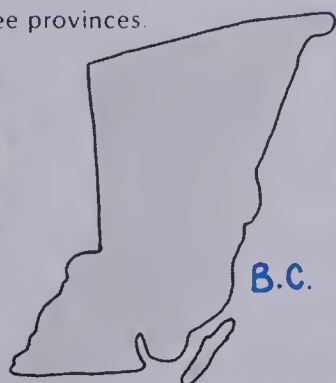


Where will the black dot be after each flip? Name the letter.



## Backward Glance

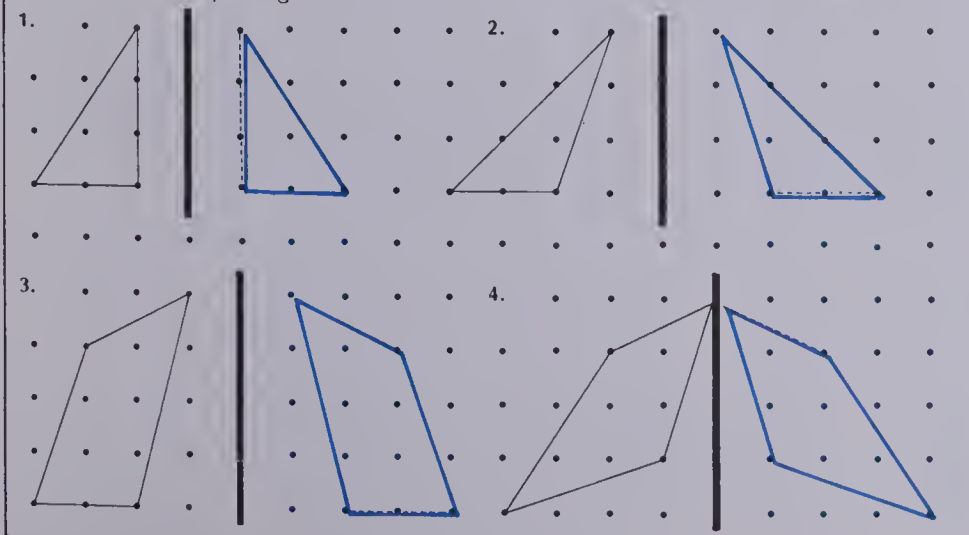
The shapes below are flips of three provinces. Name the provinces.



Sketch each province by drawing the original.

## Extra Practice

Complete each flip image.



## Worksheet G8

Pages 276-277

## Assigning the Practice

Minimum: 1-9

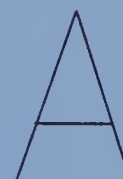
Average: 1-9

Enriched: 1-9

## Reinforcement

1. Have the students fold a piece of paper in half and cut out any figure leaving part of the fold uncut. They should open the figure and draw a line down the fold. Ask them, "Is each half of the shape the same size? Is each half of the shape the same shape? How is each half different?"

2. Ask the students to draw a line which divides the figure into two congruent parts.



3. Have the students try this. Fold a piece of paper in half. Open the paper and put a little paint somewhere on one half of the paper. Close the paper and run your hand over the paper. Open the paper and look at each half. How are the two blots the same? How are the two blots different?

4. Make a display of all letters and numerals that have a line of symmetry.

## Enrichment

1. Assign *Backward Glance* on page 277. Use tracings or a mirror. Students may look through an atlas or a wall map of Canada to compare the figures with the shapes of the provinces of Canada.

2. Have the students trace a figure, flip it over along one of its sides and trace it again. By making several such flips and tracings, they can develop a pattern and colour it.

# UNIT 12 LESSON 9

## Objective G9

Recognize and investigate circumferences and centres of circles.

### Introducing the Lesson

Give each student a worksheet with a number of circles, ovals, and polygons drawn on it. Ask them to mark the circles. Have them explain the key features of a circle (perfectly round, always the same distance across). Discuss objects that have at least one circular face. Discuss the importance of the circle to the development of our civilization (for example, wheels). Have the students trace around the outside of a round object, such as a cylindrical can.

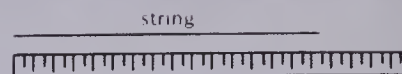
### Teaching the Lesson

Use the lesson example to draw attention to a few familiar round objects. Then introduce the term **circumference** (the distance around a circle). Point out that circumference is simply a circle's perimeter.

Use a tape measure or string to find the circumference of a ball, a cylindrical jar, and a globe. Then point out the centre of the circle in the lesson example. Each point on the circle is an equal distance from the centre. Every line that divides the circle in half will pass through the centre of the circle. Establish that each such line is a line of symmetry.

Have the students find the circumference of a tin of juice by marking a point on the edge of the tin. They place this point at the end of a ruler, then roll the tin along the length of the ruler until the marked point on the edge touches the ruler again. Then they may read the circumference from the ruler.

## Circles



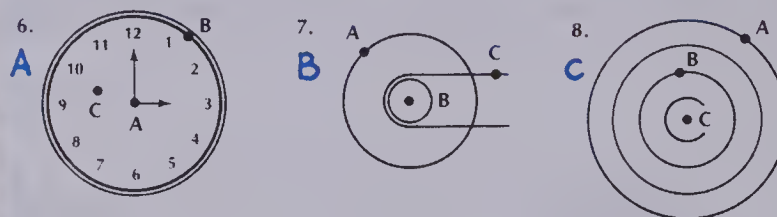
The **circumference** of a circle is the distance around it.

### EXERCISE

Does the object have a face that is a circle?

1. **yes**
2. **no**
3. **yes**
4. **no**
5. **yes**

Where is the centre of each circle?



What is the circumference of each coin?

9. 57 mm string for the circumference of a dime
10. 7 cm string for the circumference of a nickel



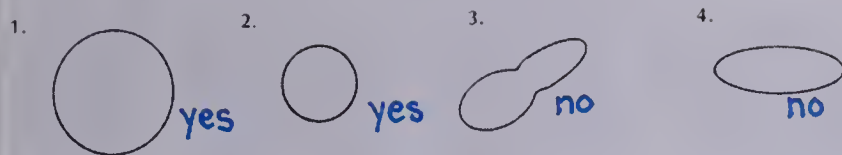
278

### Using the Exercises

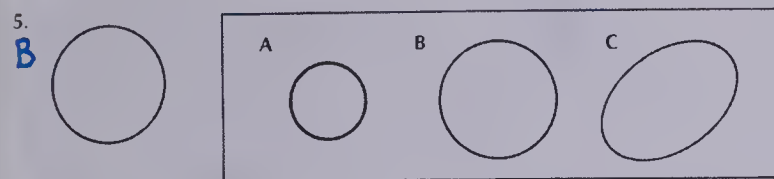
- Questions 1 to 5 require recognition of circles in real objects.
- Questions 6 to 8 require an understanding of the concept of the centre of a circle.
- Questions 9 and 10 may be reinforced and extended by having students use thread to measure the circumference of these and other coins. Discuss: Which coin has the largest circumference? Which coin has the smallest circumference?



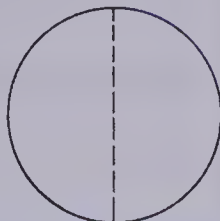
Is the figure a circle?



Which figure (A, B, or C) is congruent to the first figure?



6. Cut out a circle from a piece of paper.  
Fold the circle in half.  
Unfold the circle and fold it again in another place.  
Repeat once more.  
Mark the centre of the circle.  
Measure the length of each fold segment.  
Compare the lengths. What do you find?



7. How many lines of symmetry does a circle have? **Same infinite (many)**

## The Amazing Band

- Cut a strip of paper 30 cm long and 2 cm wide.  
Twist the paper once.  
Then glue the ends together.  
Draw a line along the strip.  
**Do not** lift your pencil once you have started.  
Continue the line.  
What happens to the line?  
Cut along the line you have drawn.  
What happens to the strip?



279

## Assigning the Practice

Minimum: 1-6

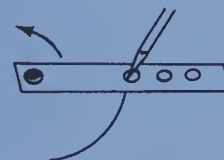
Average: 1-6

Enriched: 1-7

## Reinforcement

1. The *Amazing Band*, page 279, is a Möbius Strip. It appears to have only one side. A practical application of the band is its use as a belt on machinery—the belt wears out evenly.

2. Assist the students with this activity. Make a cardboard strip 6 cm long with holes punched at 3 cm, 4 cm, and 5 cm from one end. Place a piece of paper on a thick piece of cardboard or cork. Put the zero end of the centimetre strip near the middle of the paper and fasten it with a thumb tack. Put a pencil in the 3 cm hole and trace a circle by turning the strip. Cut out the circle. Fold it in half. Unfold it and fold again in another place. Repeat. Mark the centre of the circle. Discuss how the centre is related to the fold lines.



Use the other holes in the strip to make other circles. Find the centres of these circles.

3. Make a design using circles only. Colour the design.

4. Find the circumference of several circular figures using a string and ruler.

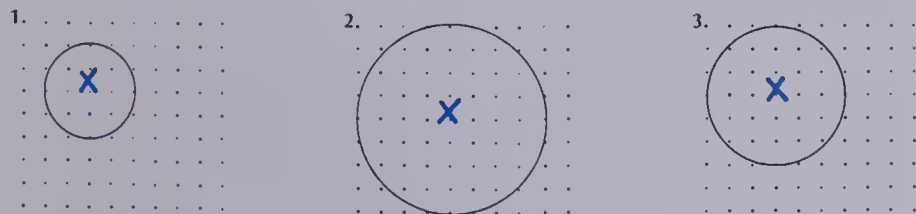
## Enrichment

1. Draw circles using a centimetre strip as outlined in the second Reinforcement activity. Measure the circumference of each circle. What do you notice? *The circumference is about 6 times the mark used to draw the circle on the centimetre strip.*

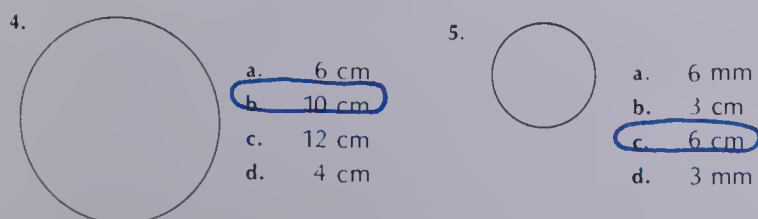
2. Ask students to mark 3 points on a piece of paper (not in a straight line). Challenge them to draw a circle free-hand through the 3 points. A circle can be drawn through any such 3 points, though sometimes it is difficult to visualize.

## Extra Practice

Mark the centre of each circle with an X



Choose the correct circumference.



## Worksheet G9

Pages 278-279

# UNIT 12 LESSON 10

## Objective G10

Recognize and demonstrate turns.

### Introducing the Lesson

Introduce **turns** with a discussion of things that turn, for example, hands on a clock, wheels, phonograph turntables, etc. Ask students to identify the point about which those things turn. The **turn centre** may be the centre of the object, a point on the outer edge of the object, or a point outside the object. Note that the size and shape of the turning object does not change during the turn. The position of the object does change. Point out that objects can turn in two directions, clockwise and counterclockwise. Discuss commands, such as right turn, left turn, and about turn.

### Teaching the Lesson

Use the lesson example to illustrate turns. Follow the licence plate around the wheel as it turns. Note the direction of the turn (clockwise). Define

$\frac{1}{4}$ ,  $\frac{1}{2}$ , and  $\frac{3}{4}$  turns.

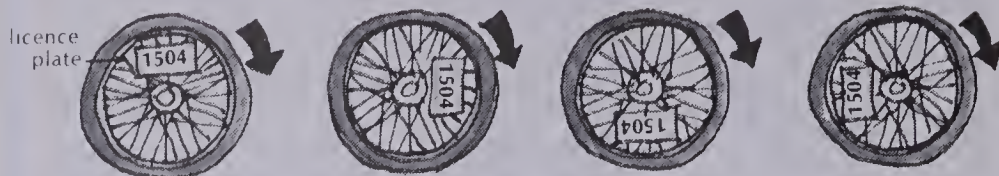
Give each student a paper clip. Ask the students to turn the paper clip along the edge of the desk, noting the obvious point that there is no change in size or shape. Then put the paper clip on a piece of plain paper. Secure one end of the clip with a finger and trace the u-shaped end of the clip.

Turn the paper clip through a  $\frac{1}{4}$  turn and trace the end again. Do various turns both clockwise and counterclockwise.

Place one end of a strip of cardboard near the centre of a piece of paper and trace along one side. Hold one end of the strip and turn the other end a quarter turn, and trace along the same side again. Notice the size of the angle and name it. *Right angle*

## Turns

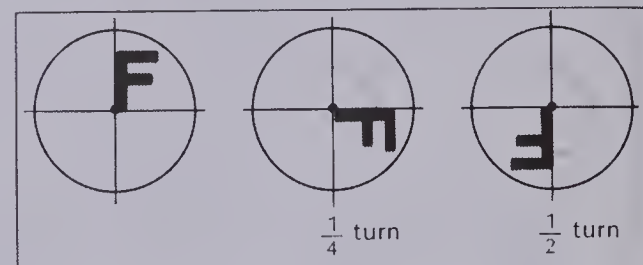
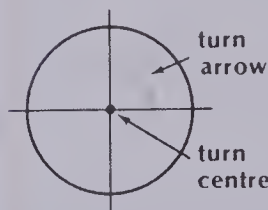
The wheels on a bicycle **turn** as the bicycle moves forward



$\frac{1}{4}$  turn

$\frac{1}{2}$  turn

$\frac{3}{4}$  turn

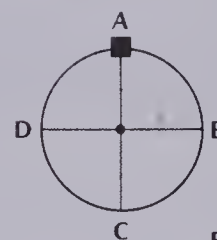


WALK

Watch the turn arrow!

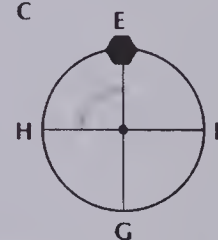
Where will the square be after:

1. a quarter turn? **B**
2. a half turn? **C**
3. a three-quarter turn? **D**



Where will the hexagon be after:

4. a quarter turn? **H**
5. a half turn? **G**
6. a three-quarter turn? **F**

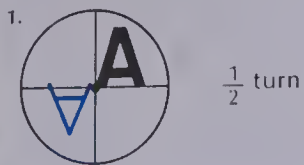


### Using the Exercises

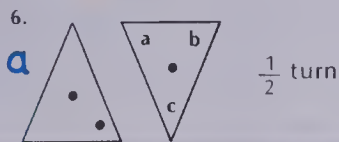
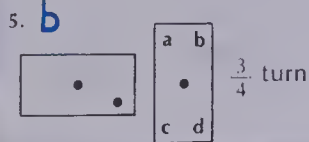
- In questions 1 to 3, students name the letter at the required position. Note that the circle and the letters are meant to be fixed. Only the black square is to move.
- Questions 4 to 6 are similar but they involve *counterclockwise* turns. Point out the importance of checking the direction of the turn arrow before attempting to answer any question. Also, in describing a turn, the direction must be mentioned unless it is understood that we are dealing with only one type of turn.

## PRACTICE

Copy the picture. Draw the turn as indicated



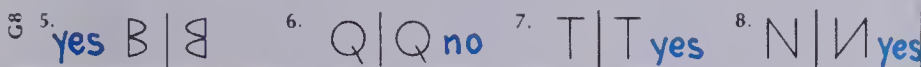
Where will the black dot be after each turn? Name the letter.



Does the drawing suggest a slide?



Does the drawing show a flip?



Is the figure a circle?



Does the drawing show a turn?



281

## Assigning the Practice

Minimum: 1-2

Average: 1-4

Enriched: 1-6

## Review Exercises

Questions	Objective	Pages
1-4	G7	274-275
5-8	G8	276-277
9-12	G9	278-279
13-16	G10	280-281

## Reinforcement

1. Ask the students to draw a straight line across a paper. Place one edge of a cut out rectangle on the line. Trace the rectangle. Turn the rectangle so another edge is on the line. Trace again. Repeat one more time. Ask, "Does the object change size? Does the object change shape? What changes?"

2. Lead the students through this activity. Cut a shape from a cardboard square leaving the edges of a square corner uncut. On a piece of 3 cm squared paper with 4 squares on it, place the corner of the cut out shape on the squared paper so that the corner is at the centre.

Trace the shape. Turn the shape so that it fits similarly in another square and trace it again. Repeat in the remaining squares. Ask, "How is each tracing the same? How are the tracings different?"



## Enrichment

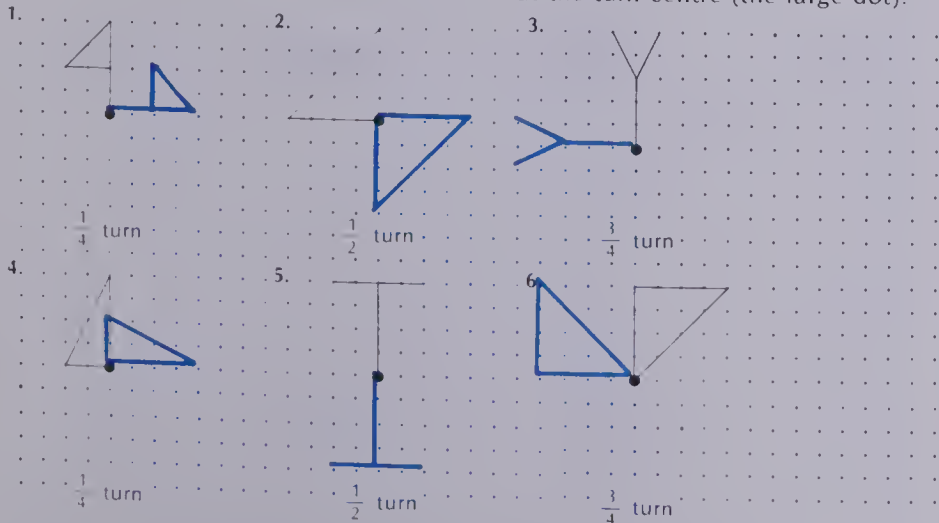
Give the students polygons. Have each trace his or her figure through a series of turns to make a pattern. They may colour the patterns and make a bulletin board display. It will be challenging for the students to choose figures that will fit to make a regular pattern. Equilateral triangles are a good starting point.

## Extra Practice

### Worksheet G10

Pages 280-281

Draw each object after a clockwise turn about the turn centre (the large dot).





Unit 12 Objectives	Test Questions	Pages
G1	1-4	262-263
G2	5-8	264-265
G3	9-12	266-267
G4	13-14	268-269
G5	15-16	270-271
G6	17-19	272-273
G7	20	274-275
G8	21, 22	276-277
G9	23	278-279
G10	24-26	280-281

# TEST

# UNIT 12

Name each solid

1.



cube

2.



cylinder

3.



pyramid

4.



cone

How many right angles are in each figure?

5.



4

6.



1

7.



0

8.



2

Does the figure have parallel lines?

Does it have perpendicular lines?

9.



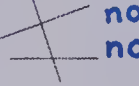
yes  
yes

10.



yes  
no

11.



no  
no

12.



yes  
no

Name each figure.

13.



rectangle

14.



square

15.



triangle

16.



right  
triangle

Are the figures congruent?

17.



yes

18.



no

19.



yes

Does the figure suggest a flip or a slide?

20.



slide

21.



flip

22.



flip

23. Draw a circle and label the centre and the circumference.

Draw each figure after the turn.

24.



$\frac{1}{2}$  turn

25.



$\frac{3}{4}$  turn

26.



$\frac{1}{4}$  turn

## Post-test

## Unit 12

Name the solid.

1.



cube

2.



cylinder

3.



pyramid

4.



cone

Mark all the right angles.

5.



6.



7.

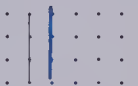


8.



Draw each.

9.



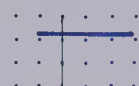
parallel line

10.



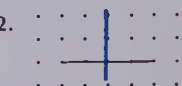
parallel line

11.



perpendicular line

12.



perpendicular line

13.



square

14.



rectangle

15.



triangle

16.



right-angle triangle

# COMPUTATION: X, ÷

Multiply.

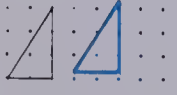
1.  $14 \times 20 = 280$
2.  $63 \times 30 = 1890$
3.  $23 \times 40 = 920$
4.  $47 \times 60 = 2820$
5.  $76 \times 80 = 6080$
6.  $34 \times 21 = 714$
7.  $62 \times 33 = 2046$
8.  $19 \times 45 = 855$
9.  $74 \times 68 = 5032$
10.  $69 \times 83 = 5727$
11.  $230 \times 30 = 6900$
12.  $523 \times 20 = 10460$
13.  $617 \times 40 = 24680$
14.  $579 \times 80 = 46320$
15.  $863 \times 70 = 60410$
16.  $203 \times 23 = 4669$
17.  $524 \times 21 = 11004$
18.  $715 \times 34 = 24310$
19.  $678 \times 48 = 32544$
20.  $947 \times 79 = 74813$

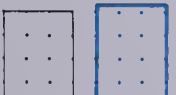
Divide.

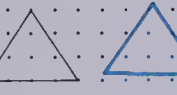
21.  $456 \div 1 = 456$
22.  $999 \div 9 = 111$
23.  $884 \div 4 = 221$
24.  $936 \div 3 = 312$
25.  $468 \div 2 = 234$
26.  $896 \div 8 = 112$
27.  $684 \div 6 = 114$
28.  $892 \div 4 = 223$
29.  $957 \div 3 = 319$
30.  $656 \div 2 = 328$
31.  $903 \div 7 = 129$
32.  $870 \div 6 = 145$
33.  $625 \div 5 = 125$
34.  $768 \div 4 = 192$
35.  $777 \div 3 = 259$
36.  $849 \div 2 = 424 \text{ R}1$
37.  $675 \div 3 = 225$
38.  $871 \div 6 = 145 \text{ R}1$
39.  $888 \div 7 = 126 \text{ R}6$
40.  $909 \div 8 = 113 \text{ R}5$
41.  $461 \div 2 = 230 \text{ R}1$
42.  $749 \div 7 = 107$
43.  $928 \div 3 = 309 \text{ R}1$
44.  $986 \div 9 = 109 \text{ R}5$
45.  $721 \div 4 = 180 \text{ R}1$


Solve.


46. At a picnic, children got 4 free tickets for refreshments. 916 tickets were given out. How many children got the tickets?  $229$
47. A race was 3 laps around a track. The total distance was 510 m. How long was each lap?  $170 \text{ m}$


17.   
congruent triangle


18.   
congruent rectangle


19.   
congruent triangle


20.   
slide

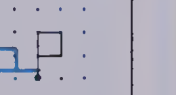
21.   
flip

22.   
flip

23.   
circle

24.   
 $\frac{1}{4}$  turn

25.   
 $\frac{1}{2}$  turn

26.   
 $\frac{3}{4}$  turn

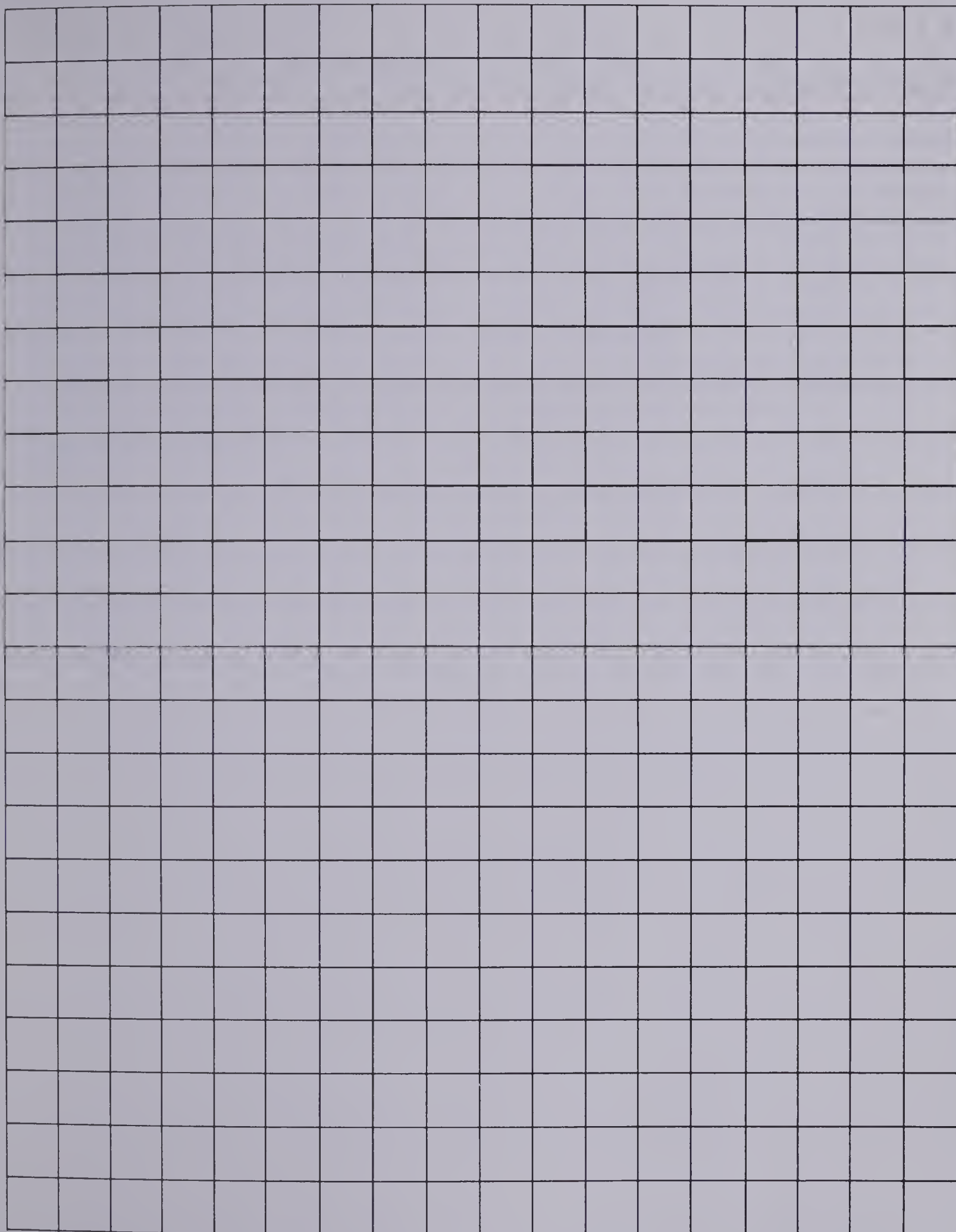
# UNIT 13

## Graphs

Theme: The Circus

Lesson	Objective		Pages
Preview		Skip counting and multiplication.	285
1	PS12	Read and interpret charts and tables.	286-287
2	GR1	Read and make pictographs (1:1, 2:1).	288-289
3	GR2	Read and make pictographs (5:1, 10:1, 50:1, 100:1).	290-291
4	GR3	Read and make bar graphs (1:1, 2:1, 5:1).	292-293
5	GR4	Read and make bar graphs (10:1, 50:1, 100:1, 500:1).	294-295
6	GR5	Read and make point graphs.	296-297
7	GR6	Identify locations (cells) on grids by using ordered pairs.	298-299
8	GR7	Write an ordered pair for a point on a coordinate grid.	300-301
9	GR8	Record a slide on a coordinate grid.	302-303
10	PS13	Use or make diagrams to solve problems.	304-305
Test		Graphs	306
Review		Geometry	307







# About This Unit

In this unit, students become familiar with one kind of graph before proceeding to a different kind. Students learn to read and interpret information given in charts and graphs and to draw graphs. Problem solving skills are refined through the use of charts and graphs as sources of information.

Students should be able to read and interpret information given in chart and graph form before attempting to draw their own graphs or to solve problems using information taken from a graph.

Discuss the essential parts of a graph and its use before asking students to draw one. Provide many opportunities for students to draw their own graphs. Use graph paper if at all possible.

# Ideas

Two bulletin board displays can be created while doing this unit. The theme is *The Circus*. Have the students bring in pictures and stories about the circus. Discuss any statistical information that can be found in these contributions.

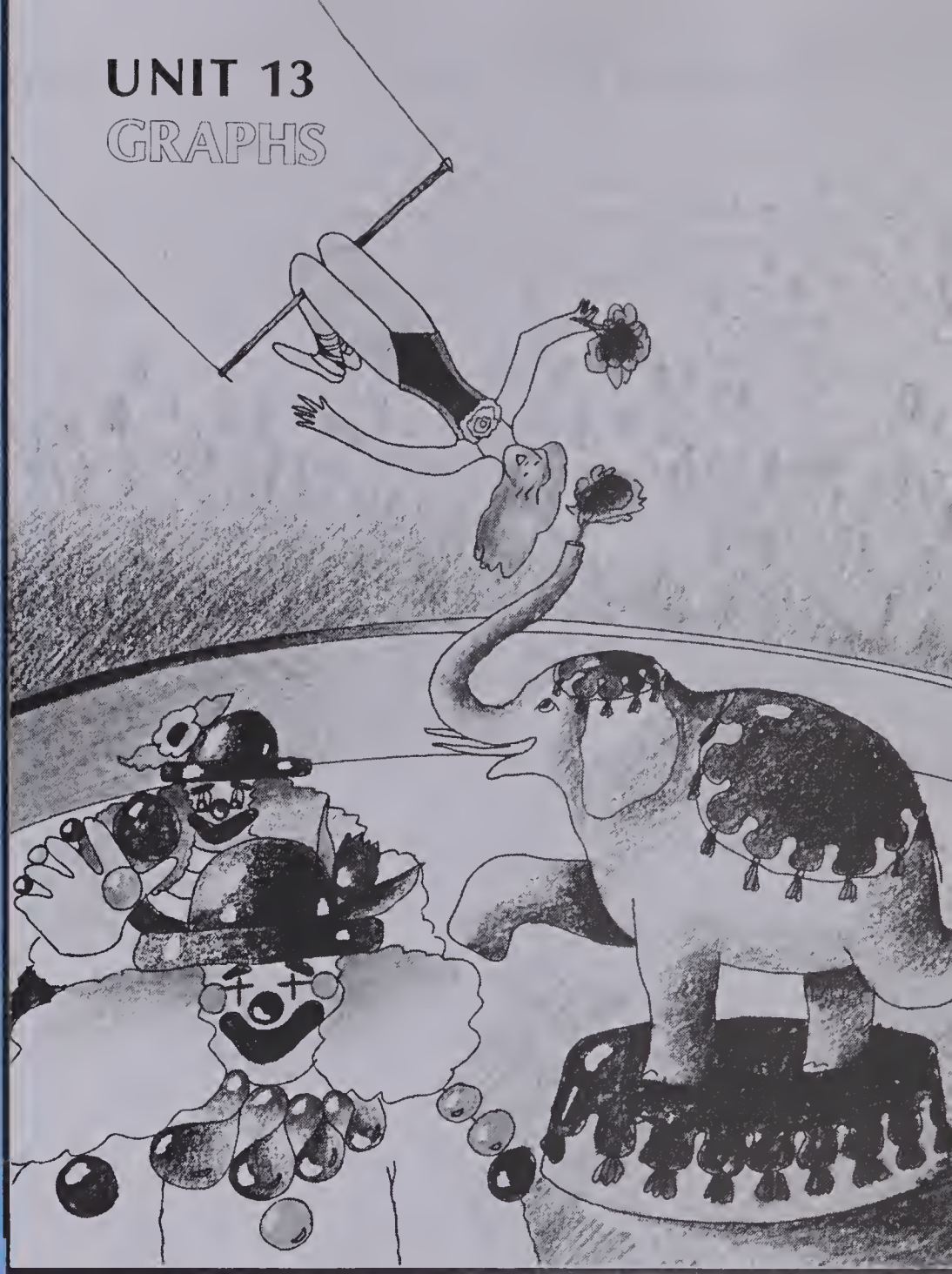
Ask the students to bring in any examples of graphing they can find in newspapers and magazines. Discuss the graphs and identify the types of graphs. Discuss how the graphs make it easier to understand the information being given and which graphs are easiest (and hardest) to interpret.

This unit can be integrated with a similar Social Studies or Science unit that requires data collecting and graphing skills.



# UNIT 13

## GRAPHS



Unit 13 Objectives	Test Questions	Pages
GR1-GR2	1-3	288-291
GR3-GR4	4-6	292-295
GR5	7	296-297
GR6	8-10	298-299
GR7	11-13	300-301
GR8	14	302-303

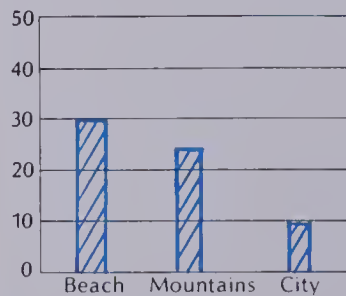
### Pretest

### Unit 13

- How much money did Bill earn? **30¢**
- How much money did Edna earn? **25¢**
- Who earned most? **Joan**

Money Earned for Chores

Bill	☺☺☺
Edna	☺☺☺
Joan	☺☺☺☺☺



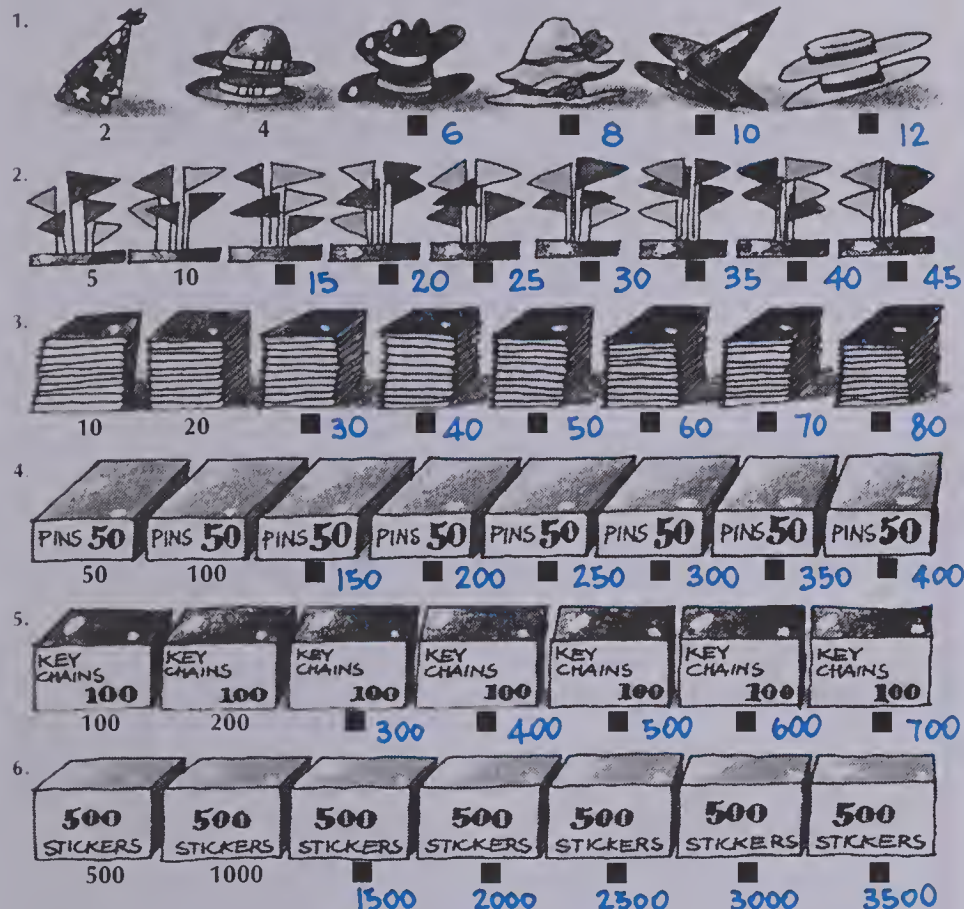
Title: **Answers vary.**

Complete a bar graph for favourite vacation spots.

- Beach: 30
- Mountains: 25
- City: 10

# Souvenir Count

Skip count to find the number of items in each row.



Record of Supplies					
Hats	$6 \times 2 =$	12	Pennants	$9 \times 5 =$	45
Programmes	$8 \times 10 =$	80	Pins	$8 \times 50 =$	400
Key chains	$7 \times 100 =$	700	Stickers	$7 \times 500 =$	3500

285

## UNIT 13 PREVIEW

### Suggestions

Find out if any of the pupils have been to the circus and ask them to tell the class about what they saw.

Start a bulletin board display on the circus by asking the children to bring in circus pictures. Have the students create circus pictures during an art period and add these pictures to the display.

Ask the students to make up math problems based on the collection of pictures or using the picture on page 284 of the textbook.

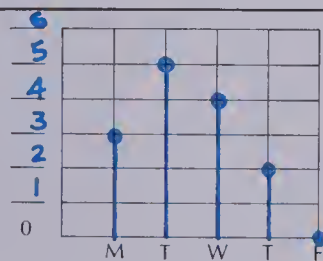
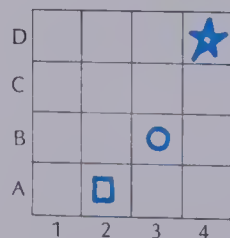
### About the Page

All students should attempt the review exercises on page 285. Explain that a vendor at the circus skip counts the objects or boxes and checks the result by multiplying the number of stacks (boxes) by the number in each stack (box). Students can check their answers in the same way.

### Reinforcement

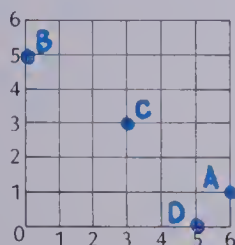
If students are having difficulty, a review of skip counting and multiplying by powers of ten will be necessary before attempting the unit. The pictographs and bar graphs in Unit 13 require this skill. Use counters and place-value blocks to work with the students. Give ample extra practice beyond the exercises given on this page.

- Draw a point graph for the daily temperatures.  
 Monday: 3°C      Thursday: 2°C  
 Tuesday: 5°C      Friday: 0°C  
 Wednesday: 4°C



- Draw a circle at 3B.
- Draw a square at 2A.
- Draw a star at 4D.

- Mark an A at point (6, 1).
- Mark a B at point (0, 5).
- Mark a C at point (3, 3).
- Starting at C, slide 2 right and 3 down. Mark a D at the new point.





# UNIT 13 LESSON 1

## Objective PS12

Read and interpret charts and tables.

### Introducing the Lesson

Survey charts and tables taken from newspapers, reports, textbooks, and magazines to show how they represent a variety of information. Stress that charts and tables such as these cover many aspects of our lives and play an important role in practical decision making.

### Teaching the Lesson

Refer to the *Circus Facts* table in the textbook. Point out the importance of having a title so that everyone will know what the table is about. Discuss the headings *Date*, *Place*, and *Name of Owner*, and the information listed under each. Note that the headings are listed across the top. To find any fact (such as the place of the first circus parade), locate the type of fact (*Place*) across the top. Then go down the column until you are even with the information you want (first circus parade). Read off the answer. *Albany, N.Y.*

Why are some spaces blank? (Sometimes historical information is lost because so much time has passed and records may not have been kept.)

## Charts and Tables

Here are some little-known circus facts.

Circus Facts

	Date	Place	Name of Owner
first known circus	1768	London, Eng.	Philip Astley
first circus in North America	1792	Philadelphia	J B Ricketts
first circus in Canada	1798	Quebec City	—
first circus in a tent	1826	—	—
first circus parade	1837	Albany, N.Y.	—
first 2-ring circus	1873	—	P T. Barnum

### EXERCISES

Use the table to answer these questions.

- When was the first known circus? **1768**
- Where was the first circus in North America? **Philadelphia**
- Who owned the first 2-ring circus? **P.T. Barnum**
- What took place in Albany? **first circus parade**
- How many years was it from the first circus in North America to the first circus in Canada? **6 years**
- For what two facts do we not know the place? **first circus in a tent**  
**first 2-ring circus**
- How high can a sea lion leap? **2.2 m**
- Which can leap higher, a tiger or a kangaroo? **kangaroo**
- How much wider can an impala leap than a tiger? **4 m**
- Which animal can leap the highest? the farthest? **kangaroo** **Impala**

Animal Leaps

	High (m)	Wide (m)
Sea lion	2.2	—
Kangaroo	3.0	7.5
Tiger	2.0	6.0
Impala	—	10.0

286

### Using the Exercises

- Do questions 1 to 6 together. Make sure the students are reading the table properly. If necessary, help them with the alignment of rows and columns. Use a blank piece of paper to align the rows if students have trouble reading across.
- Assign questions 7 to 10 to be done in students' notebooks. Review the answers with the class before assigning the Practice.



## PRACTICE

### Circus Animals

	Mass (kg)	Length of Head and Body (cm)	Length of Tail (cm)
Brown Bear	250	200	7
Camel	600	325	—
Lion	250	190	100
Elephant	5000	500	120
Leopard	60	150	90

- How heavy is an elephant? **5000 kg**
- How long is a brown bear's tail? **7 cm**
- How long is a camel? **325 cm**
- What is a lion's mass? **250 kg**
- Which animals have a length greater than 300 cm? **Camel, Elephant**
- Which animal listed has the least mass? **Leopard**

### Circus Attendance

	Day 1	Day 2	Day 3
Burnam	3075	4850	4100
Oakvale	2300	2920	3240
Laval	850	1030	1160

- Which city had the highest attendance on Day 3? **Burnam**
- On which day did Oakvale have its highest attendance? **Day 3**
- Which city had an attendance below 1000 on Day 1? **Laval**

## USING THE CALCULATOR

Can you make the calculator display read 19, using only the **5** key and the operations **+** **×** **—** **÷** ?

You must use an operation key after each 5.



**# of operations may vary**  

$$[(5 \times 5 \times 5) - (5 \times 5) - 5] \div 5 = 19$$

287

## Assigning the Practice

Minimum: 1-9

Average: 1-9

Enriched: 1-9

## Reinforcement

1. Have students make a table about their:

- favourite pets
- favourite foods.

Survey any 10 students to get answers.

2. Have all students list their:

- mass in kilograms
- height in centimetres.

Make a master list. Students may then make a table using the names of people.

- Who are the 10 heaviest?
- Who are the 10 tallest?
- Who are the 10 shortest?
- Who are the 10 lightest?
- Who are females?
- Who are males?

## Enrichment

1. Assign *Using the Calculator* on page 287.

2. Students can suggest their own topics and gather information to make a table. Have 3 or 4 examples done on acetate. Use these examples with the whole class as a review. Ask students to write questions for each table.

## Extra Practice

### Worksheet PS12

Pages 286-287

The table shows the number of seats in each of five baseball stadiums. Complete the table by rounding each number to the nearest thousand.

City	Team	Seats	Seats to nearest 1000
1. Boston	Red Sox	33 538	<b>34 000</b>
2. Montreal	Expos	60 476	<b>60 000</b>
3. Cleveland	Indians	76 713	<b>77 000</b>
4. Toronto	Blue Jays	43 737	<b>44 000</b>
5. Seattle	Mariners	59 438	<b>59 000</b>

- Which city has the greatest number of seats? **Cleveland**
- Which city has the fewest seats? **Boston**

## Objective GR1

Read and make pictographs (1:1 and 2:1).

### Introducing the Lesson

Discuss collecting and organizing data. Ask the pupils what they might see if they went to the circus (animals, acts, performers, booths selling things, people, etc.).

Ask the students how they would collect data about the circus (observing, counting, asking, reading). Discuss how they could organize the data (animals: according to kind, size, mass, etc.; performers: according to kind of act done, colour or kind of costume, male or female, adult or child, etc.).

### Teaching the Lesson

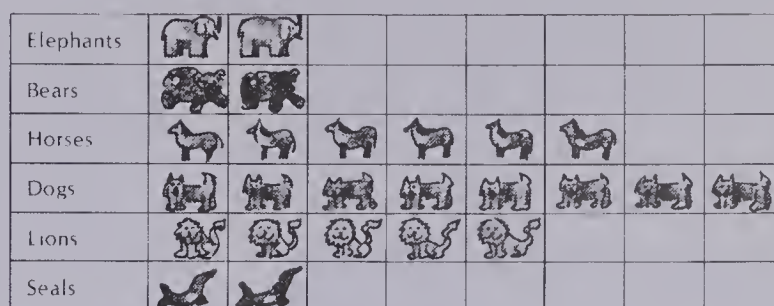
Use the lesson example to introduce pictographs. Ask students to give an interpretation of the graph's story and to explain what information in the graph leads them to that interpretation. In the discussion, emphasize the necessary components of a pictograph: *title, labels, and picture representations*.

Point out that the picture representations should be aligned *one-to-one* so that small pictures do not bunch up together. Uneven alignment leads to misinterpretation of the graph.

## Pictographs

Carl wrote a letter to his father describing the circus he saw. He used pictures to tell about the animals.

Animals in the Circus



Each picture represents one animal

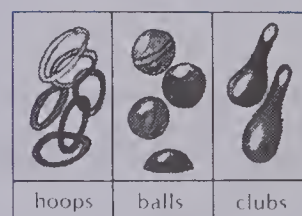
### EXERCISES

Use the pictograph above to answer the questions.

1. What animals did Carl show on his graph? **Elephants, Bears, Horses, Dogs, Lions, Seals**
2. What does each picture represent? **one animal**
3. How many of each kind of animal were there? **2 Elephants, Seals, Bears, 6 Horses, 8 Dogs, 5 Lions**
4. What is the title of Carl's pictograph? **Animals in the Circus**

Janelle used pictures to show things the juggler used in his act.

The Juggler's Props



Each picture represents two objects

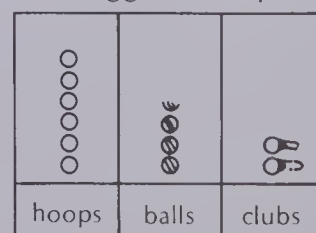
5. How many objects does each picture represent? **2 objects**
6. How many hoops did the juggler use? **12**
7. How many balls does a picture of half a ball represent? **1 ball**

288

### Using the Exercises

- Questions 1 to 4 are designed to help the students read and interpret a given pictograph.
- Before answering questions 5 to 7, the students should examine carefully the graph on the right. This graph will introduce the students to a 2:1 picture representation and to the use of part of a symbol to represent a number of objects. Ask why this is not a proper pictograph. *The objects are not aligned one-to-one.* Have the students redraw the graph properly. Discuss why this is a better way to show the data. Then assign questions 5 to 7. Ask why a 2 to 1 ratio was used. *It makes the graph smaller and easier to read.*

The Juggler's Props



Each picture represents two objects.

## PRACTICE

Make a pictograph

- At the circus, a boy was selling food to the people in the stands. At Carl's row he sold 2 bags of peanuts, 9 cans of pop, 5 ice cream bars, and 6 boxes of popcorn. Make a pictograph to show this. Use one picture for each item sold.

- Make a pictograph to show the number of people waiting in a ticket line. There were 14 boys, 18 girls, 6 ladies, and 10 men. Use a picture of a face to represent two people.

- Janelle's class put on a carnival at school. The Fortune Teller booth took in 16 tickets, the Fish Pond 25 tickets, and the Dog Show 10 tickets. Make a pictograph to show this. Let each drawing of a ticket represent two tickets.


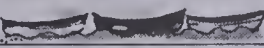

Pictures show  
7 boys, 9 girls,  
3 ladies, 5 men

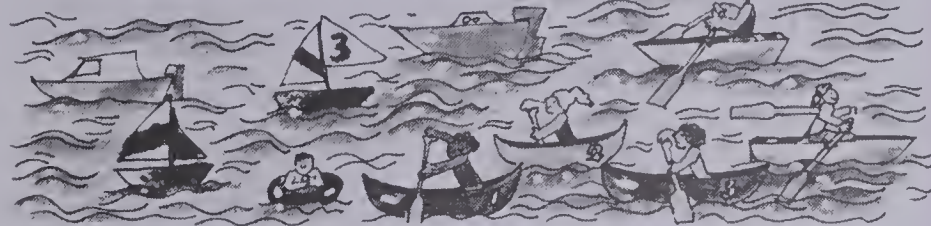
Picture show  
F.T. 8 tickets  
F.P. 12.5 tickets  
D.S. 5 tickets

## Stop, Look, and Report

### See Reinforcement #1

What is wrong with this pictograph?

Sailboats	
Canoes	
Motorboats	



Make a new pictograph for the data in the picture.

289

## Assigning the Practice

Minimum: 1-3

Average: 1-3

Enriched: 1-3

## Reinforcement

1. All students may try *Stop, Look, and Report* on page 289. Students should notice that a title for the graph is missing, as well as a statement about what each picture represents. Rowboats and inner tubes are missing from the pictograph. The pictures are not aligned one-to-one.

2. Let students work in small groups to survey their classmates about favourite TV programs, sports, or books. Let each group draw a pictograph to show the results they obtained.

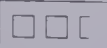

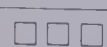

3. Have students make pictographs using actual objects instead of pictures. Bottle caps, leaves, can labels, and so on, can be glued on construction paper to make the graph.

## Enrichment

Using the graphs made in the third Reinforcement activity, have students write a series of questions which could be asked about each graph.

## Extra Practice

- Books Read in One Week

Bruce	
Janet	
Sherri	
Peter	

1 picture represents 2 books

- How many books did each student read during the week? **Bruce 5, Janet 4, Sherri 8, Peter 6**
- What was the total number of books read by the students? **23**
- Who read twice as many books as Janet? **Sherri**

## Worksheet GR1

Pages 288-289

- Make a pictograph to show the information given in the chart.

Play Equipment  
Used on our Street

Bicycles	15
Skateboards	13
Roller skates	8



UNIT 13 LESSON 3

Objective GR2

Read and make pictographs (5:1, 10:1, 50:1, and 100:1).

Introducing the Lesson

Review multiplication by 10 and counting by 5s, 10s, 50s, and 100s.

Review the information needed on a pictograph for it to have meaning: title, labels, and picture representations.

Teaching the Lesson

Use the lesson example to introduce a pictograph with a picture representation of 5:1. Discuss the fact that students may use skip counting or multiplication to find the actual number of acrobats, trainers, and clowns. Note that the title, labels, and picture representations on the graph give the graph some meaning.

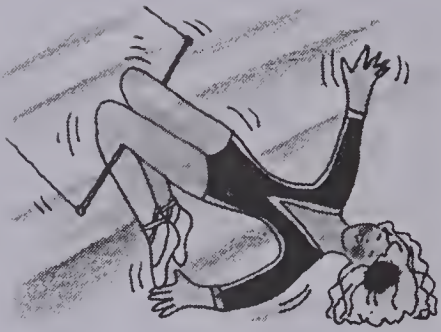
Remind students that, in a proper *pictograph*, the picture representations should be aligned so they are in one-to-one correspondence. Ask them to redraw the performers graph so that all the pictures are the same size. This will give them good preparation for doing bar graphs.

More Pictographs

Performers in Best Brothers' Circus

Acrobats	
Animal Trainers	
Clowns	

Each picture represents 5 people



EXERCISES

Use the pictograph to answer the questions.

- 1. How many people does each picture represent? 5 people
- 2. How many clowns are in the circus? 15
- 3. How many acrobats are there? 10
- 4. How many animal trainers are there? 5
- 5. How many more clowns than acrobats are in the circus? 5
- 6. What words help you understand the graph? Each picture represents 5 people.

This pictograph shows how much food was sold at the circus in one day.

Food Sold in One Day

Hot dogs	
Hamburgers	
Popcorn	

Each picture represents 50 things

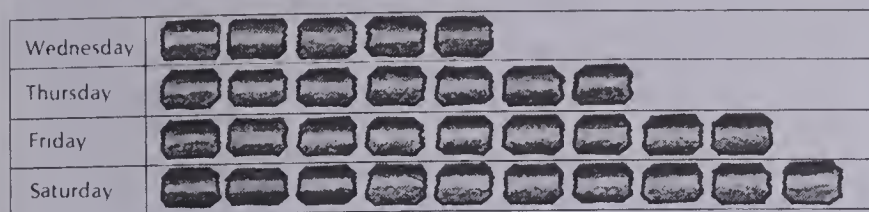
- 7. What item was the best seller? popcorn
- 8. Which item had the least sales? Hamburgers
- 9. Why is one half a hamburger shown? 50 + 25 hamburgers
- 10. How many more hot dogs than hamburgers were sold? 75
- 11. Make a pictograph showing attendance at the circus. On Wednesday there were 150 people, Thursday 225, Friday 350, and Saturday 600. Use 1 picture to represent 50 people. Picture shows 3 people, Wed. 4 1/2 people, Thurs 7 people, Fri. 12 people, Sat.

Using the Exercises


- Questions 1 to 6 are designed to provide practice in reading a pictograph and extracting information from it.
- Before discussing questions 7 to 10, ask the students to read the graph on the right in the textbook. This graph will introduce a picture representation of 50:1. Some discussion of the use of part of a symbol is required. Discuss reasons why this graph uses part of a symbol, but the example at the top of the page does not. Ask students to draw their own pictograph so that all the pictures are the same size and are aligned.
- Question 11 requires the students to draw their own graphs. Make sure the graphs are labelled and titled.

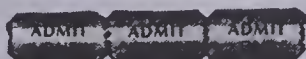
## PRACTICE

### Children's Tickets Sold at the Circus



 represents 100 tickets

- How many children's tickets were sold on Thursday? **700**
- How many children's tickets were sold on Saturday? **1000**
- On which day were the most children's tickets sold? **Saturday**
- On which day were the least number of children's tickets sold? **Wednesday**
- Suppose each  on the graph above represented 10 tickets. How many tickets would have been sold on each day? **Wed. 50, Thurs. 70, Fri. 90, Sat. 100**
- Rasheed made a pictograph for Children's Tickets Sold at the Circus. He used the information given in the graph at the top of this page. He drew pictures of tickets, but he did not leave a space between the tickets. What did his graph look like? Make a graph like his.



## Graph Your Own

Make a pictograph to show the number of students in each grade in your school. Let each picture represent 10 students. A half picture will represent 5 students. Round the number of students in each grade to the nearest 5 before drawing your graph.

291

## Assigning the Practice

Minimum: 1-6

Average: 1-6

Enriched: 1-6

## Reinforcement

- Assign *Graph Your Own* on page 291.
- Make a pictograph to represent this information.
  - 4 quarters, 3 dimes, 2 nickels, 10 pennies
  - 1 pumpkin, 3 squash, 2 watermelons, 4 tomatoes
  - 25 chocolates, 100 jelly beans, 100 ju ju beans, 50 licorice sticks
  - 10 cats, 25 dogs, 20 hamsters, 10 turtles
  - 75 cashew nuts, 100 peanuts, 25 walnuts, 50 pecans
  - 15 softballs, 5 basketballs, 10 soccer balls, 20 playground balls
- Prepare a bulletin board display of pictographs made by students or collected from newspapers and magazines. Mark the picture representation on each graph clearly.

## Enrichment

Have students choose any one graph on display. List all the questions they can formulate using the information revealed by the graph (the greatest, the least, the difference, the total, etc.). The questions can be assigned as drill for weaker students.

## Extra Practice








## Worksheet GR2

Pages 290-291

Draw pictographs to show the information.
















- 5 red balls  
15 blue balls  
10 yellow balls  
5 green balls
- 500 stamps  
700 coins  
250 marbles  
300 rocks

Title: **Number of Balls**

Red	
Blue	  
Yellow	 
Green	

Each picture represents **5** balls

Title: **Items in Collection**

Stamps	   
Coins	    
Marbles	  
Rocks	  

Each picture represents **100** things

# UNIT 13 LESSON 4

## Objective GR3

Read and make bar graphs (1:1, 2:1, and 5:1).

## Introducing the Lesson

Review Rasheed's picture graph (question 6, page 291) where the symbols were drawn without a space between them. By labelling the horizontal scale, Rasheed's pictograph becomes a *bar graph*. Discuss the difference between a pictograph and a bar graph. Instead of individual pictures, one continuous bar is used to represent the information. A bar graph has number labels along one edge to help read off the information. This is called the *scale*.

## Teaching the Lesson

Use a flow chart to show Sari's procedure in drawing the circus animal bar graph.

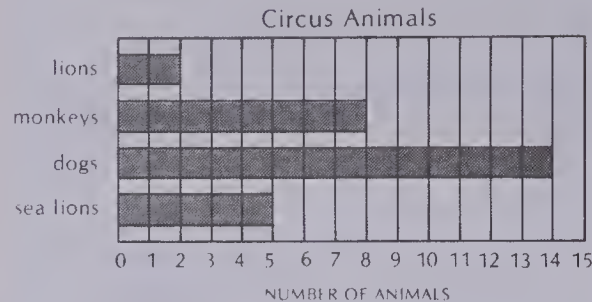
- Draw a horizontal line.
  - Mark and label the scale.
  - Draw a vertical line on the left.
  - List the items along the vertical line.
  - Draw the bars.
  - Give the graph a title.
- Emphasize that all bars should be the same width and the scale must show equal intervals.

Discuss reasons why a bar graph might be preferred over a pictograph (easier to draw, fewer symbols, more accurate, etc.).

Students should use graph paper when drawing bar graphs to save time and to increase accuracy.

## Bar Graphs

Sari counted certain animals in the circus. She made a bar graph.



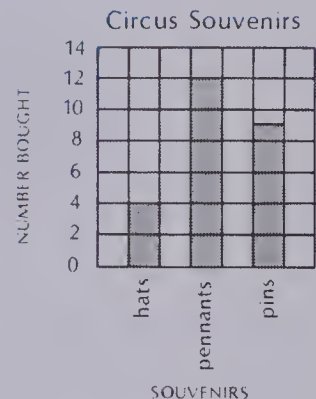
## EXERCISES

Use the bar graph above to answer these questions.

- How many dogs were in the circus? **14**
- How many monkeys were in the circus? **8**
- Of which animal was there the fewest number? **lions**
- What might be the reason Sari made a bar graph instead of a pictograph? **Easier to draw.**

Rob made this vertical bar graph.

- What souvenirs were sold? **hats, pennants, pins**
- How many pins were sold? **9**
- What was the greatest number of souvenirs sold? **12 pennants**
- How many more pennants than hats were sold? **8**



292

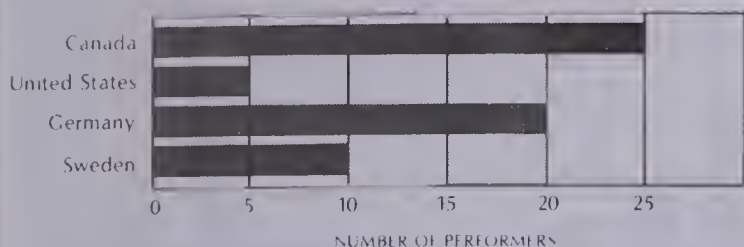
## Using the Exercises

- Do questions 1 to 4 orally with the class.
- Before doing questions 5 to 8, ask students to examine the scale (2:1). This graph will also introduce interpolation (or betweenness) when reading the number of souvenir pins sold. Ask what number is halfway between 8 and 10 to elicit the meaning of the "pins" bar.



## PRACTICE

Birthplace of Performers in Best Brothers' Circus

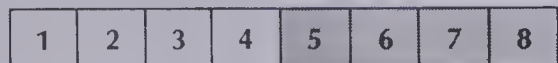


- From which two countries do most of the performers come? **Canada, Germany**
- How many performers come from Sweden? **10**
- Each section on the graph represents how many performers? **5**
- How many more performers come from Germany than from Sweden? **10**

tiger	2 km
lion	9 km
sea lion	3 km

- Use the information on the left to make a bar graph for the distance an animal's roar can be heard.

## Breaking the Bar



How can you rearrange the squares so that they form a row of alternating colours? Move two adjacent squares at a time. Do not change the order of the squares being moved.



293

## Assigning the Practice

Minimum: 1-5

Average: 1-5

Enriched: 1-5

## Reinforcement

- All students may try *Breaking the Bar* on page 293. Cutting out squares and moving them will help the students solve it.
- Use information from newspapers, magazines, or catalogs to make graphs.
- Graph the heights of class members. A second graph can be made several months later to show changes in height.
- Roll a die 60 times. Make a bar graph showing the results of the throws.

## Enrichment

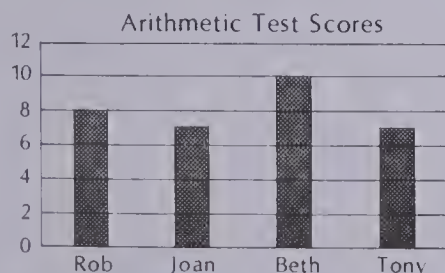
Have students choose a graph made in the second Reinforcement activity and make a list of questions that can be asked about the information given.

## Extra Practice

Use the graph to answer the following questions.

## Worksheet GR3

Pages 292-293



- Who has the highest score? **Beth**
- What is Joan's score? **7**
- What is the difference between the highest and lowest scores? **3**
- Which students have the same score? **Joan and Tony**

# UNIT 13 LESSON 5

## Objective GR4

Read and make bar graphs (10:1, 50:1, 100:1, and 500:1).

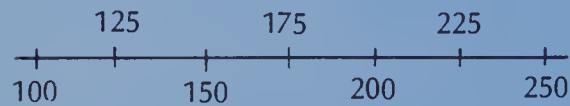
## Introducing the Lesson

Review counting by 10s, 50s, 100s, and 500s. Discuss the information needed on a bar graph to give it meaning. Review Sari's steps for drawing a bar graph from page 292.

## Teaching the Lesson

Using the lesson example, emphasize the importance of reading the title and the scale of a graph before interpreting it. Large numbers do not necessarily mean longer bars than small numbers. The scale determines the length. Students will have to interpolate to find the number of ice cream bars and sandwiches on both graphs.

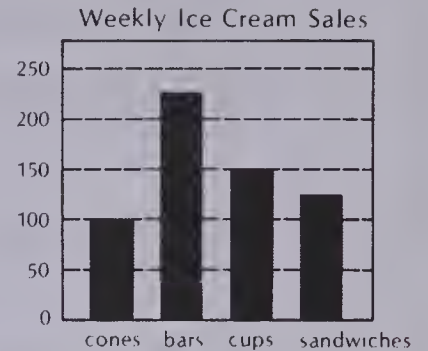
Use a number line to demonstrate that 45 is *halfway* between 40 and 50; that 225 is *halfway* between 200 and 250; and so on.



Remind students that when they are drawing bar graphs, they should make all bars the same width and the spaces between the numbers on the scale should be equal.

## Using Larger Numbers

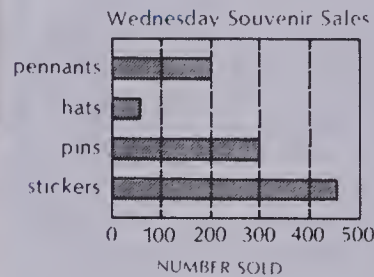
A vendor kept a record of ice cream sales at the circus.



### EXERCISES

Use the graphs above to answer the questions.

- How are the two graphs the same? *number of bars, height of each bar*
- How are the two graphs different? *scales*
- Which kind of ice cream was the best seller? *bars*
- How many ice cream cones were sold in one day? *20*
- How many bars were sold in one week? *225*
- How many more bars than sandwiches were sold each day? *20*



- What was the total number of souvenirs sold on Wednesday? *1000*
- Which souvenir was the best seller? *stickers*
- How many hats were sold? *50*
- How many stickers were sold? *450*

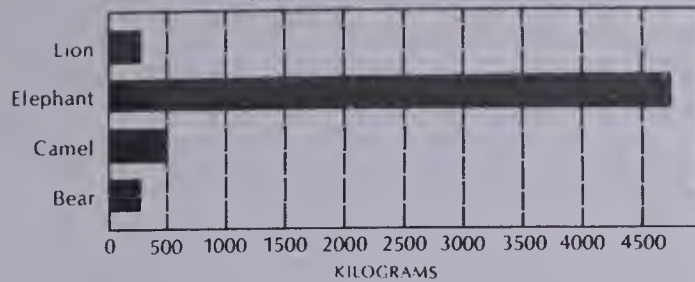
294

## Using the Exercises

- Do questions 1 to 6 orally with the whole class.
- Discuss the bar graph before assigning questions 7 to 10. How is the scale marked? *In hundreds*. What is the title? What are the labels?

## PRACTICE

Mass of Circus Animals



- What is the mass of the heaviest animal? **4750 kg**
- Which two animals have the same mass? **Lion, Bear**
- The camel's mass is how much more than the bear's mass? **250 kg**
- Does one elephant have a greater mass than a lion, a camel, and a bear together? **yes**

## REVIEW

GR1

- Use the information in the chart to draw a pictograph. Let 1 picture represent 2 pieces of fruit. **Picture shows 1 apple, 2½ oranges, 2 pears**

Apples	2
Oranges	5
Pears	4

GR2

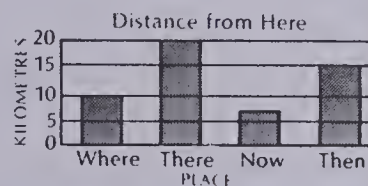
- How many chocolates? **50**
- How many kisses? **20**
- How many more suckers than kisses? **10**

Suckers	5
Kisses	2
Chocolates	5

1 picture = 10 treats

GR3

- City farthest from Here? How far? **There, 20 km**
- City closest to Here? How far? **Now, 7.5 km**



GR4

- Make a bar graph to show 1000 pennies, 1500 nickels, 750 dimes, and 500 quarters. **Scale 500:1. Show 2 pennies, 3 nickels, 1½ dimes, 1 quarter**

295

## Assigning the Practice

Minimum: 1-4

Average: 1-4

Enriched: 1-4

## Review Exercises

Questions	Objective	Pages
1	GR1	288-289
2-4	GR2	290-291
5-6	GR3	292-293
7	GR4	294-295

## Reinforcement

1. Prepare a bulletin board display of graphs made by students. Be sure the scale on each is labelled.

2. Ask students to find examples of new kinds of pictographs and bar graphs in newspapers, magazines, and catalogs.

3. What scale would you use if you were going to make a graph to show:

- heights of mountains?
- heights of flowers?
- lengths of rivers?
- distances between cities?
- scores on arithmetic tests?
- babysitting earnings?
- house league team victories?

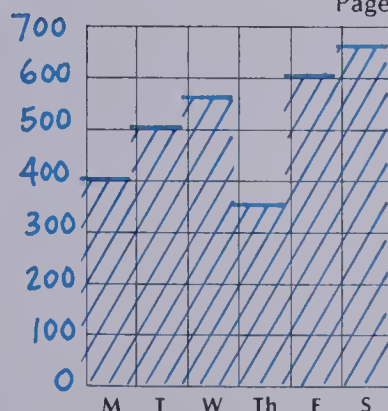
## Enrichment

Provide maps of the Canadian provinces. Have students choose a map and any type of graph to show the distances from any five cities or towns to the provincial capital. They must use the scale on the map.

## Extra Practice

Draw a bar graph using the following information. The number of people that came to see the magician in the side show varied from day to day.

Monday:	400
Tuesday:	500
Wednesday:	550
Thursday:	350
Friday:	600
Saturday:	650



Title: **Daily Audience**

## Worksheet GR4

Pages 294-295



Objective GR5

Read and make point graphs.

Introducing the Lesson

Review the necessary components of a bar graph (title, labels, scale). Then use the graph *Distance from Here* at the bottom of page 295. Draw the graph several times on the chalkboard, each time with a different width bar. Ask the students whether it makes any difference if the bars are wide or narrow. Ask what is important about the bar. *How far it reaches—the heights of the bars.*

Teaching the Lesson

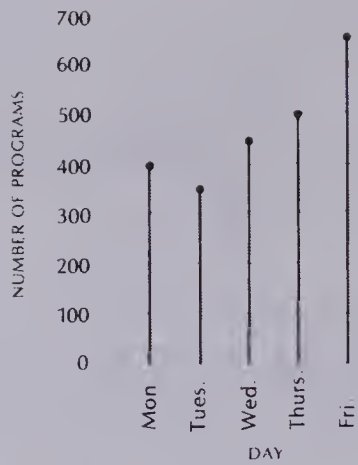
Use the lesson example to introduce the point graph. The point graph is much the same as a bar graph. Emphasize that the point graph is made by drawing thin bars (lines) with points on the ends to represent quantities. Note the similarities between a point graph and a bar graph. The graph is read at the end of the line (just as with a bar graph), the axes are labelled, and there is a title. There is one difference: the bars are now lines.

The point graph on the bottom of the page introduces the use of two numerical scales. With this kind of graph, it is even more necessary to label each scale. Daily temperature readings, growth rates of plants, and distance covered over a period of time are all good topics to graph using point graphs.

Point Graphs

George sold programs at the circus. He kept a record of the number of programs he sold each day.

Here is the graph he made to show his sales.



EXERCISES

Use the graph above to answer the questions.

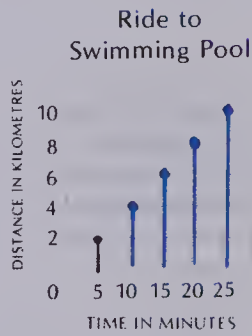
- 1. How many programs did George sell on Monday? 400
- 2. How many programs did he sell on Wednesday? 450
- 3. On which day did George sell the most programs? Fri.
- 4. On which day did he sell the fewest programs? Tues.
- 5. How many more programs did he sell on Thursday than on Monday? 100

Erika rode her bicycle 10 km to the swimming pool. She found she could go 2 km every 5 min.

- 6. Make a chart to show how far she had gone every 5 min.

minutes	5	10	15	20	25
kilometres	2	4	6	8	10

- 7. Copy and finish the graph.



Using the Exercises

- Do questions 1 to 5 orally with the whole class.
- Discuss the graph before attempting questions 6 and 7. What is the title? What does each scale show? How are the scales marked? Some students may need help doing the chart.

## PRACTICE

Make a point graph.

1. A large travelling circus has seats in the big top for 5000 people. In one city, the attendance was: Wednesday 3500 people, Thursday 3000 people, Friday 4500 people, and Saturday 5000 people. Make a point graph to show the attendance.

Scale 500:1  
Wed. 7, Thurs. 6,  
Fri. 9, Sat. 10

2. Make a point graph to show the information given in this chart.

Time	8 A M	9 A M	10 A M	11 A M	12 NOON
Temperature	17°C	18°C	21°C	23°C	24°C

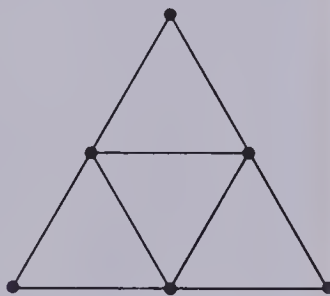
3. Marcia saved money to buy a bicycle. She saved \$2.50 the first week, \$10.00 the second week, \$5.00 the third week, and \$2.50 the fourth week. Make a point graph to show this information.
4. Keep a record of the outside temperature every hour from 9 A M to 4 P M one day. Make a point graph to show the temperature changes during this time.

Scale \$2.50:1  
1st, 1; 2nd, 4;  
3rd, 2; 4th, 1

## One Line

This figure can be drawn using one path, without lifting the pencil or retracing any segment. Use drawings to prove your answers.

- a. Can you trace the path starting from any vertex? **Start, middle triangle**
- b. Can you trace it changing direction exactly 7 times?
- c. Can you trace a path in more than 5 different ways from the top vertex?



297

## Assigning the Practice

Minimum: 1-3

Average: 1-3

Enriched: 1-4

## Reinforcement

1. Ask the students to grow a small plant such as a bean plant. They can record the height of the plant each day and make a point graph to show the growth of the plant.
2. Ask students to keep a game-by-game record of the number of points or hits their favourite hockey or baseball player gets for 5 games. Show the player's scores on a point graph.
3. Suggest that students make a point graph using string and gummed stickers. The stickers will help emphasize that the end points of this graph are the important parts.

## Enrichment

1. Assign *One Line* on page 297.
2. Have students write questions using the information given in the graphs done in the *Reinforcement* section.
3. Use the newspaper to locate the temperature in cities around Canada. Choose any 10 cities and make a point graph.

## Extra Practice

1. Marc's mass was 25 kg on his 6th birthday, 27 kg on his 7th birthday, 30 kg on his 8th birthday, and 35 kg on his 9th birthday. Make a point graph to show this.
2. A person with a mass of 70 kg went on a diet. He lost 2 kg the first week and 1 kg each of the next three weeks. Make a point graph to show his mass each week.
3. A car travels 40 km each hour. Make a point graph to show the distance a car travels in 1 h, 2 h, 3 h, and 4 h.

## Worksheet GR5

Pages 296-297

Objective GR6

Identify locations (cells) on grids by using ordered pairs.

Introducing the Lesson

Introduce the lesson with a discussion of ways by which students remember the position of a desk in the classroom, the family car in a large parking lot, a friend marching in a band, and so on. Generally, people locate the object by noting the distance across and the distance up or down from some reference point. Ask why two reference numbers (e.g., row and seat number) are used.

Teaching the Lesson

Use the lesson example of the parking lot to introduce the coordinate system of locating points. Note that each block can be located by an animal name and a number. Explain that the convention in locating points is to give the distance across first and the distance up second. This method (across, then up) will be used throughout this unit to locate points.

Locating Points

The parking lot at the circus was very large. To help people find their cars, the sections of the lot were marked with signs. The animal name and the row number helped people locate their cars.



The Delaney's car (■) is parked in section Tiger 4.

The Valdo's car (★) is parked in section Horse 1.

EXERCISES

Give the location of each of the following vehicles. Name the animal first, then the row number.

- |          |         |            |            |            |         |
|----------|---------|------------|------------|------------|---------|
| 1. Car A | Lion 3  | 2. Truck B | Horse 6    | 3. Bus C   | Seal 2  |
| 4. Bus D | Bear 5  | 5. Car E   | Horse 4    | 6. Truck F | Tiger 6 |
| 7. Car G | Tiger 1 | 8. Car H   | Elephant 2 |            |         |

Using the Exercises

- Do questions 1 and 2 with the class to ensure students can locate points on the map. Emphasize that the animal name is always given before the number.



## PRACTICE

A map often has letters and numbers to help you locate places. Give the location of each of the following places. Name the number first, then the letter.

- Circus tent **6E**
- Store **1B**
- Playground **6A**
- Church **4C**
- School **5A**
- Lake **1E**
- Fire Hall **2D**
- Library **3B**

	1	2	3	4	5	6	
E	lake					circus tent	E
D		fire hall					D
C				church			C
B	store		library				B
A					school	play-ground	A
	1	2	3	4	5	6	

## Crack the Code

The dart board at the circus was divided into small squares. Each square had a letter in it. Marcus threw his darts at the board and recorded the order in which he hit the letters. Can you figure out what the letters spelled?

D	y	n	a	r
C	s	e	w	u
B	i	o	r	b
A	a	e	t	n
	1	2	3	4



1D 2B 4C 1A 4D 2C 3D 3C 1B 4A 2D 2A 3B  
**Y O U A R E A W I N N E R**

## Extra Practice

- Give the location of the symbols by letter and number.

5 • • • ☆ •	☆	<b>D</b>	<b>5</b>
4 • • • • ⊙	⊙	<b>E</b>	<b>4</b>
3 • □ • • •	□	<b>B</b>	<b>3</b>
2 • • △ • •	△	<b>C</b>	<b>2</b>
1 • • • • •			
A B C D E			

- A player gets 4 rings to throw at a board. A score of 22 or better wins a prize. Karen's throws were A1, B2, C2, and A3. Did she win a prize? **yes**

	A	B	C	
3	8	1	6	3
2	3	5	7	2
1	4	9	2	1
	A	B	C	

## Assigning the Practice

Minimum: 1-8

Average: 1-8

Enriched: 1-8

## Reinforcement

1. All students may try *Crack the Code* on page 299. Students will know they have the correct answer when they can read the coded statement.

2. If the classroom desks are in rows, have the students make a diagram showing where the desks are. They should use a letter-number system to tell the position of each desk.

3. After the second Reinforcement activity has been done, write the positions of the desks on slips of paper. Let each student draw a slip. When all slips are drawn, students find their new locations.

4. Ask students to sketch a map of their neighbourhood, the downtown, or the surrounding area. Have them write letters and numbers along the sides and locate familiar places on the sketch.

## Enrichment

Have the students write to various large auditoriums or sports arenas, e.g., the Forum in Montreal or Exhibition Stadium in Toronto. Ask for a seating plan. These can then be used to locate seats using points of reference.

## Worksheet GR6

Pages 298-299

# UNIT 13 LESSON 8

## Objective GR7

Write an ordered pair for a point on a coordinate grid.

## Introducing the Lesson

Review the previous lesson and emphasize that two pieces of information are needed to locate a position. Remind students that, by convention, we name the horizontal position first, then the vertical position.

Introduce the term *ordered pair* to describe the two references and discuss the order of the ordered pair. Write the symbol ( , ) on the chalkboard and explain that this is the shortest way of writing directions for distances across and up.

Write (4, 1) on the chalkboard and have students explain that this means (right 4, up 1).

## Teaching the Lesson

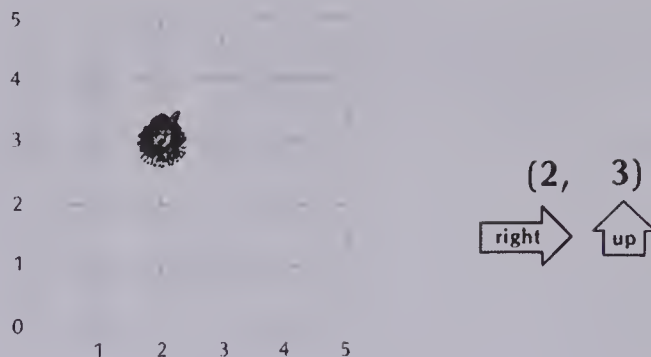
Use the grid in the lesson example to illustrate the axes and scale on a grid. Locate the position of the clown and note the ordered pair notation. Note the changes in the numbering system from the previous lesson.

- Now both axes are *numbered* (not lettered and numbered).
- Now the numbers indicate the *lines*, not the spaces.
- Now both the axes begin with zero in the lower left hand corner.

To emphasize the order in the ordered pair, write (2, 3) and (3, 2) on the board. Locate the two points on the grid. Without a convention, there would be no way of knowing which point was meant.

Ask students to find other points on the grid.

## Ordered Pairs



The clown is at the position (right 2, up 3), or (2,3).

(2,3) is the **ordered pair** which names the position of the clown on the grid.

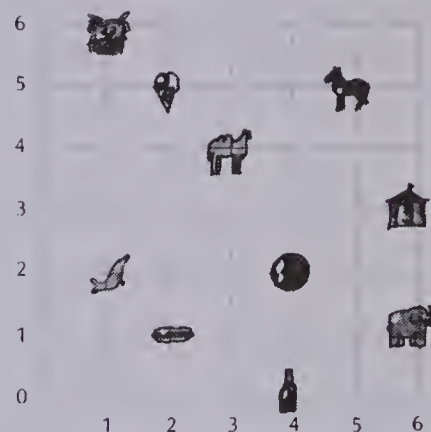
## EXERCISES

Use the grid on the right.

- The ball is (right <sup>4</sup> , up 2)
- The horse is (right <sup>5</sup> , up 5)
- The seal is (right 1, up <sup>2</sup> )
- The elephant is (right 6, up <sup>1</sup> )
- The dog is (right <sup>1</sup> , up <sup>6</sup> )

Name the object that is located at the named point.

- (2,1) <sup>hotdog</sup>
- (6,3) <sup>tent</sup>
- (3,4) <sup>camel</sup>
- (4,0) <sup>pop</sup>
- (2,5) <sup>ice cream cone</sup>



300

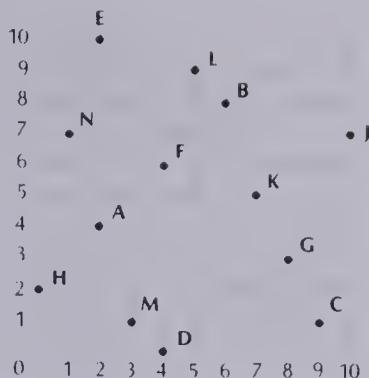
## Using the Exercises

- Questions 1 to 5 provide practice in locating points when the direction is given.
- Questions 6 to 10 provide practice in locating points using ordered pair notation.

## PRACTICE

Write the letter name of the point located by each of the following ordered pairs

1. (8,3) **G**
2. (1,7) **N**
3. (4,0) **D**
4. (7,5) **K**
5. (9,1) **C**
6. (6,8) **B**
7. (4,6) **F**



Write the ordered pair that locates each of the following letters on the grid above.

8. E **(2,10)** 9. A **(3,4)** 10. H **(1,2)** 11. J **(10,7)** 12. L **(5,9)**

## Home Sweet Home

Mark the following points on a 10 × 10 grid. Join the points in the order in which they are given.

1. (3,7)
2. (6,5)
3. (10,6)
4. (7,8)
5. (3,7)
6. (0,5)
7. (0,1)
8. (2,1)
9. (2,3)
10. (3,4)
11. (4,3)
12. (4,1)
13. (6,1)
14. (6,5)
15. (10,6)
16. (10,2)
17. (6,1)



301

## Assigning the Practice

Minimum: 1-12

Average: 1-12

Enriched: 1-12

## Reinforcement

1. Use a 7 by 7 grid. Draw a picture on it using straight lines only. Mark the coordinates for the ends of the lines. Then list the coordinates, in order, on another piece of paper. Exchange papers with a partner. Can you draw your partner's picture from the coordinates?

2. Students can play *Money Hunt*. Divide the class into two teams (2 players can also play). Each team draws an 8 cm by 8 cm grid and hides a penny, a nickel, a dime, a quarter, and a dollar on the grid. Teams take turns guessing coordinates in an attempt to capture the opponents' money. The team with the most money after a specified number of turns wins the game.

3. Make a grid on a piece of wood. Put nails or hooks on the intersecting lines. Make a set of tags with the grid coordinates on them to hang on the hooks. Two players take turns selecting a tag from a box and hanging the tag in the correct place on the grid.

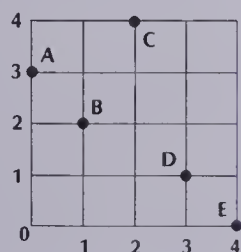
## Enrichment

*Home Sweet Home* may be assigned to better students. It requires students to plot points on a grid, something not done in the lesson.

## Extra Practice

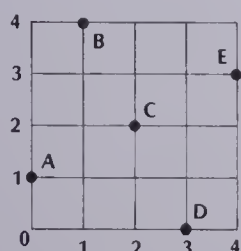
Write the ordered pair for each letter.

1. A (0, 3)
2. B (1, 2)
3. C (2, 4)
4. D (3, 1)
5. E (4, 0)



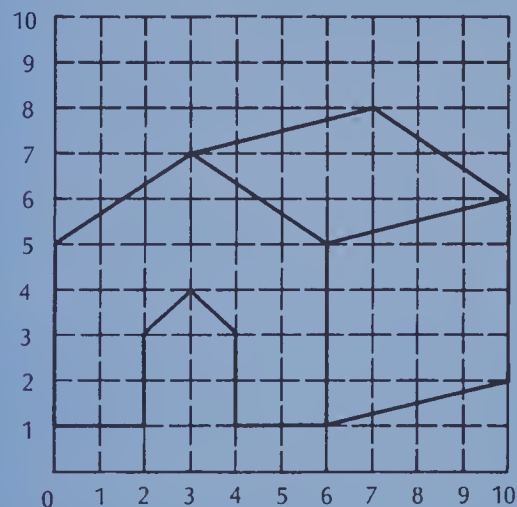
Write the letter locating the ordered pair.

6. (3,0) D
7. (1,4) B
8. (4,3) E
9. (0,1) A
10. (2,2) C



## Worksheet GR7

Pages 300-301





# UNIT 13 LESSON 9

## Objective GR8

Record a slide on a coordinate grid.

## Introducing the Lesson

Ask students to tell of slides they have taken, for example, playground, sleigh, ski, toboggan, ice, and so on. Discuss other examples of slides found in the students' environment: shuffleboard, checkers (no jumps), and pushing in a coin slot.

Slides can be introduced in the gymnasium where students can slide on the floor.

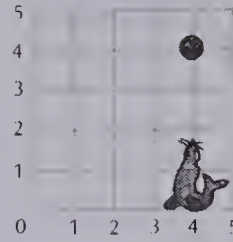
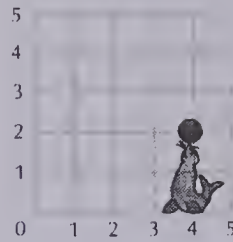
Give students sheets of squared paper (3 cm squares). Have them cut out a figure and trace it in one of the squares. Then ask them to slide the shape (over 1), (over 2 and down 1), etc. and trace it. Following the placement of a particular point on the shape will help to teach the students correspondence.

## Teaching the Lesson

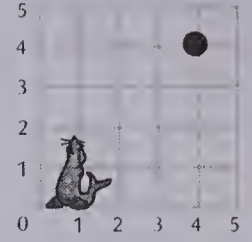
When students are familiar with the coordinate system and the mechanics of a slide, use the lesson example to show slides on a grid. Initially, the slides should be in one direction only: right, left, up, or down. The set of axes in the exercises can be used for extra practice.

If students are having no trouble with the concept of a slide, it can be extended to a slide in two directions (right and up), or a single diagonal slide.

## Slides

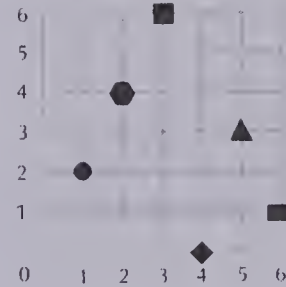


The ball slides up 2 units.



The seal slides left 3 units.

## EXERCISES



Slide the figure as indicated. Write the ordered pair of the new position.

- Slide ● up 3 **(1, 5)**
- Slide ◆ left 2 **(2, 0)**
- Slide ■ down 5 **(3, 1)**
- Slide ■ up 4 **(6, 5)**
- Slide ● right 1 **(3, 4)**
- Slide ▲ left 5 **(0, 3)**

Write the slide direction.

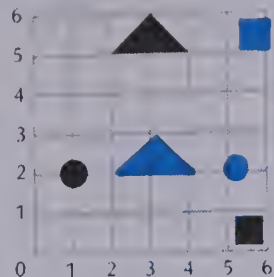
- to (0, 2) **left**
- ◆ to (4, 4) **up**
- to (1, 6) **left**
- to (2, 1) **left 4**
- to (2, 0) **down 4**
- ▲ to (5, 6) **up 3**

302




## Using the Exercises

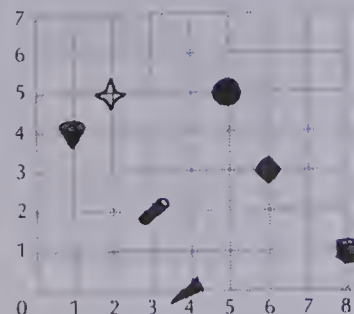
- Questions 1 to 6 will test the students' knowledge of ordered pair notation through the use of a slide. If students have trouble with these, they may be confused about either the meaning of a slide or coordinate notation.
- Questions 7 to 12 provide practice in recognizing the direction of a slide. If students are having trouble here, check whether the naming of ordered pairs is the problem.

## PRACTICE







Copy the picture. Slide the figure as indicated.  
Draw the shape in its new location.




- Slide  down 3
- Slide  right 4
- Slide  up 5



Write the slide direction and distance.

-  to (7,5) **right 2**
-  to (1,1) **left 7**
-  to (3,0) **down 2**
-  to (1,6) **up 2**

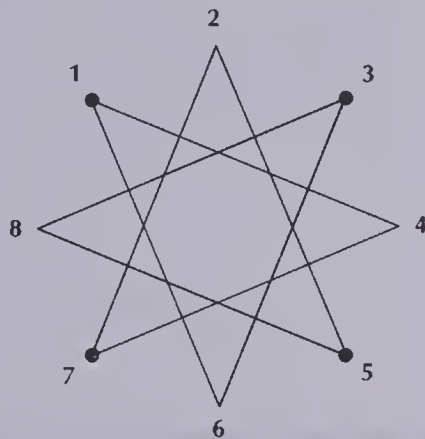
Write the ordered pair of the new position.

- Slide  right 1 **(7,3)**
- Slide  left 2, up 3 **(2,3)**
- Slide  right 4, down 5 **(6,0)**

## Slippery Slides

Put red chips on 1 and 3.  
Put blue chips on 5 and 7.

Move the chips, one at a time, along the line segments to numbered points. A chip may not land on or pass another chip. Keep moving the chips until the red chips are on 5 and 7 and the blue chips are on 1 and 3.



303

## Assigning the Practice

Minimum: 1-10

Average: 1-10

Enriched: 1-10

## Reinforcement

1. *Slippery Slides* on page 303 can be assigned to all students. It can be made more challenging by having students find the minimum number of moves required to achieve the interchange.

2. Draw a straight line across a paper. Place one edge of an eraser at one end of the line. Trace the eraser. Slide the eraser along the line and trace it again. Repeat one more time. Did the object change size? Did the object change shape? Did the object turn? What changed?

3. In this activity, use 3 cm by 3 cm squared paper. On another, smaller piece of paper, cut out this shape.



Put the shape against two corners in any square and trace it. Mark the X. Slide the shape to another square. Trace it and mark the X. Repeat two or three times. Did the object change size? Did the object change shape? Did the object turn? Did the X move in the shape? What changed?

4. A photographer wants 3 copies of a photograph. Make the copies.



5. Give students squared paper and a cutout. Ask them to make a pattern using slides of the cutout.

## Enrichment

1. Using wallpaper sample books, have students choose patterns that represent slides.

2. Using potatoes, cut out a pattern. Make a pattern print with paint and newsprint using only slides.

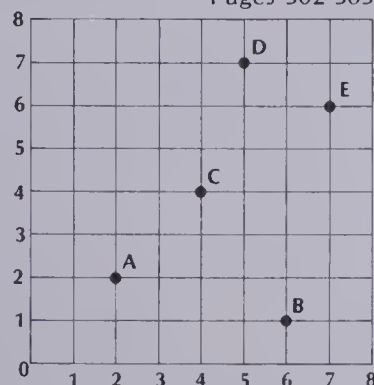
## Extra Practice

Complete the chart.

Point	Slide	New Point
1. A (2, 2)	right 2	(4, 2)
2. B (6, 1)	up 6	(6, 7)
3. C (4, 4)	right 3, up 2	(7, 6)
4. D (5, 7)	down 5	(5, 2)
5. E (7, 6)	left 4, down 1	(3, 5)

## Worksheet GR8

Pages 302-303



## UNIT 13 LESSON 10

## Objective PS13

Use or make diagrams to solve problems.

## Introducing the Lesson

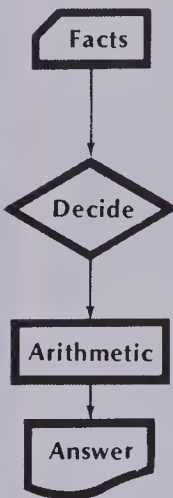
Discuss with your students the old saying, "A picture is worth a thousand words." Give a verbal description of a peculiarly-shaped lot or building that is difficult to describe verbally, but which can be recognized when a diagram is drawn. Ask the students to make or draw a geometric figure or solid that fits the description. Suggest that they draw the figure as you describe it. For example, "What kind of path is formed when you walk straight for 5 m, turn right and walk 8 m, turn right again and walk 5 m, and then return to your starting place?" It might be difficult to get the answer unless a diagram is drawn as the words are read. (You may find that many students who are good at reading have difficulty with this type of game, and that some who do not have good reading skills excel.) If the students have difficulty making diagrams, give them experience with other drawing games and activities, as well as with the analysis and interpretation of pictures and diagrams.

## Teaching the Lesson

Work through the problem in the lesson example with the class. Develop the diagram on the board, one side at a time, then discuss the solution. Point out that drawing a diagram often eliminates the need to use concrete materials to illustrate a problem situation. Another advantage of a diagram is that it can be used to show only the details that are important in solving the problem.

## Using Diagrams

A farmer fenced off a pond to keep his cattle away from it. Each side had ten posts that held up a mesh fence. How many posts were used altogether?

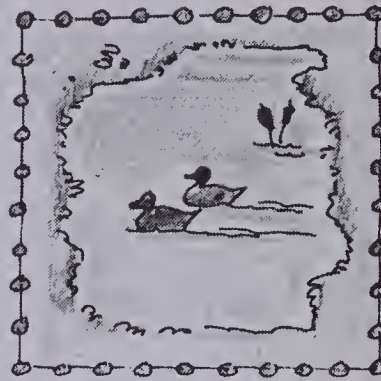


10 posts on each side.  
Draw a diagram to  
show this.

**Add** to find the number of posts used *altogether*.

$$10 + 10 + 8 + 8 = 36$$

There were 36 posts used altogether.



Solve.

## EXERCISES

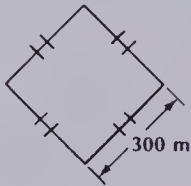
- 1.



How many metres of fencing?

25 m

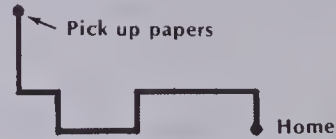
- 3.



1200 m

What is the perimeter?

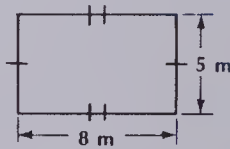
- 2.



How long is the paper route?  
(in blocks) 11 blocks

11 blocks

- 4.

 $40 \text{ m}^2$ 

What is the area?

## Using the Exercises

- These questions present other examples of problems that are easily solved by using diagrams.



## PRACTICE

Make a diagram for each problem. Then solve the problem.

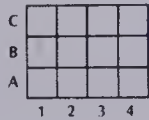
1. A new house was built in the shape of a hexagon. Each side was exactly 8 m long. What was the perimeter of the building? **48 m**
2. Reg's bedroom is 4 m wide and 4 m long. How many square metres of carpet are needed to carpet his room? **16 m<sup>2</sup>**
3. A play area is in the shape of a triangle. Each side is 20 m long. Fence posts, 5 m apart, are put around it. How many fence posts are needed? **12**
4. There are 8 cars lined up at a stop sign. Each of the cars is 4 m long. There is a 2 m space between each car and the car in front of it. How long is the line of cars? **46 m**

## REVIEW

GR 5

1. John spent 10¢ Mon., 25¢ Tues., 55¢ Wed., and 30¢ Thurs. Make a point graph to show this.

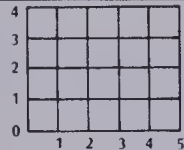
GR 6



Complete.

2. ★ is in square ■ A. **I**
3. ▲ is in square 1■. **B**
4. ● is in square ■■. **3A**

GR 7



Complete.

5. Letter ■ is at (2,1). **C**
6. Letter ■ is at (1,3). **B**
7. Letter ■ is at (4,2). **E**

Use the grid above to complete each sentence.

GR 8

8. Slide A right 4. It will be where letter ■ is now. **G**
9. Slide D left 2, down 1. It will be where letter ■ is now. **A**

305

## Assigning the Practice

Minimum: 1-4

Average: 1-4

Enriched: 1-4

## Review Exercises

Questions	Objective	Pages
1	GR5	296-297
2-4	GR6	298-299
5-7	GR7	300-301
8-9	GR8	302-303

## Reinforcement

1. Make a list of some uses of diagrams in the everyday world.
2. Have each student think of a problem situation and then make a diagram of it. Then see if the rest of the class can identify the particular situation.

## Enrichment

1. Make a diagram for this problem and then solve it.

A display is made with 5 cans in the bottom row. In the next row, the cans do not set directly on top of the cans in the bottom row. They are half on one can and half on another. The next several rows do the same, until the display reaches a peak. How many cans are used in the display?

2. Try the above problem starting with other numbers of cans on the bottom (2, 3, 4, ...). Without using a diagram, predict how many cans are needed if the bottom row has 10 cans. **45**

## Extra Practice

## Worksheet PS13

Pages 304-305

1. What is the perimeter of a rectangular field 45 m wide and 70 m long? **230 m**
2. You go 5 blocks north, 5 blocks east, 1 block south, and 2 blocks west. How far are you from home? **7**
3. You have a box 3 cm wide and 7 cm long. How many tiles 2 cm by 1 cm can you put in one layer on the bottom of the box? **10**
4. A cube is sliced in half from one corner to the opposite corner. What kind of figure is formed? **square**

## Problem Solving Activities

Assign Level 4, Unit 12

Unit 13 Objectives	Test Questions	Pages
GR1-GR2	1-3	288-291
GR3-GR4	4-6	292-295
GR5	7	296-297
GR6	8-10	298-299
GR7	11-13	300-301
GR8	14	302-303

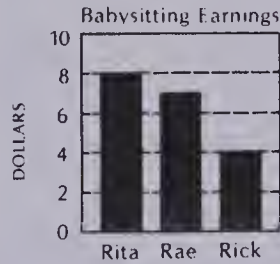
# TEST

# UNIT 13

- How many stamps did Nicole save? **30**
- Who saved the most? **Pat**
- How many does a picture of half a stamp represent? **5**

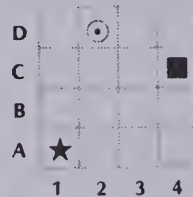
Stamps Saved	
Nicole	
Pat	
Christina	

represents 10 stamps



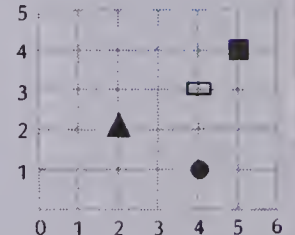
- How much did Rita earn? **\$8**
- How much did Rick earn? **\$4**
- How much more did Rita earn than Rae? **\$1**

- Joe's marks in mathematics were: Mon. 85, Tues. 70, Wed. 95, Thurs. 85, and Fri. 100. Make a point graph to show this.



- In what square is ★? **1 A**
- In what square is ⊙? **2 D**
- In what square is ■? **4 C**

- What ordered pair gives the location of ▲? **(2, 2)**
- What figure is at (4, 1)? **●**
- What ordered pair gives the location of ■? **(5, 4)**
- Slide □ right 1, down 2. What is the ordered pair of its new location? **(5, 1)**

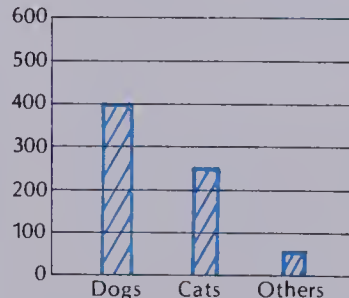


306

## Post-test

## Unit 13

- How many books did Erica read? **8**
- How many books did Bill read? **9**
- Who read the most? **Jean**



Books Read	
Erica	
Jean	
Bill	

represents 2 books.





Complete a bar graph for favourite pets.

- Dogs: 400
- Cats: 250
- Others: 50

Title: \_\_\_\_\_

# GEOMETRY

Name each solid.





1.  cylinder
2.  rectangular solid
3.  prism
4.  sphere

How many right angles are in each figure?

5.  1
6.  4
7.  4
8.  6

Does the figure have parallel lines?

Does it have perpendicular lines?

9.  perp.      10.  both      11.  neither      12.  parallel





Is the figure a rectangle?

13.  yes
14.  no
15.  yes
16.  yes

How many equal sides are there in each triangle?

17.  2
18.  0
19.  3
20.  2

Name each figure (pentagon, rectangle, triangle, or circle).

21.  rectangle
22.  pentagon
23.  triangle
24.  circle

Does it look like a flip?

25.  yes
26.  no
27.  yes



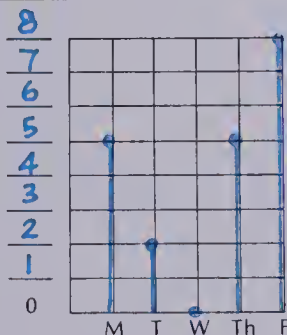
28. Where will the triangle be after a  $\frac{1}{2}$  turn? **C**
29. Where will the triangle be after a  $\frac{1}{4}$  turn? **B**

7. Draw a point graph for the daily rainfall.

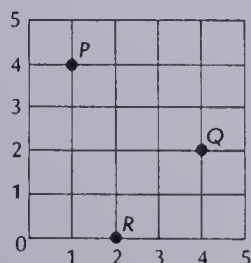
Monday:	5 mm	Thursday:	5 mm
Tuesday:	2 mm	Friday:	8 mm
Wednesday:	0 mm		

D	S			
C		X		
B				A
A				
	1	2	3	4

8. Draw an X at 2C.
9. Draw an A at 4B.
10. Draw an S at 1D.



11. Where is P? (1, 4)
12. Where is Q? (4, 2)
13. Where is R? (2, 0)
14. Slide 2 right and 3 down from P. Where is the new point? (3, 1)



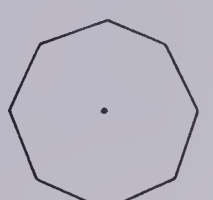
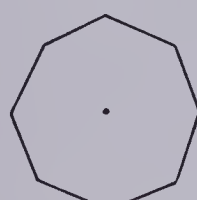
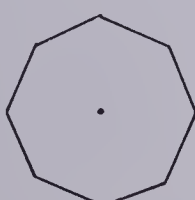
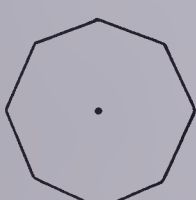
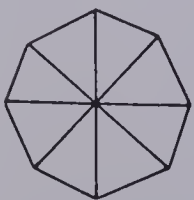
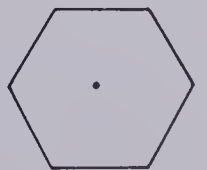
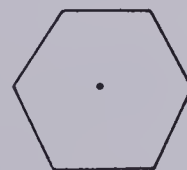
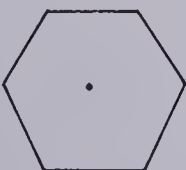
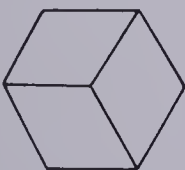
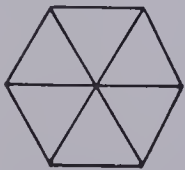
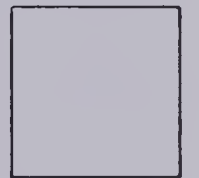
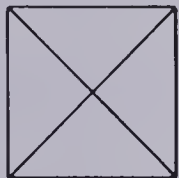
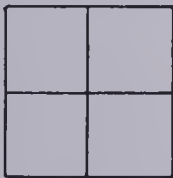
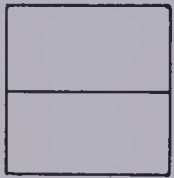
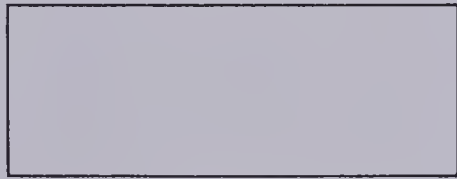
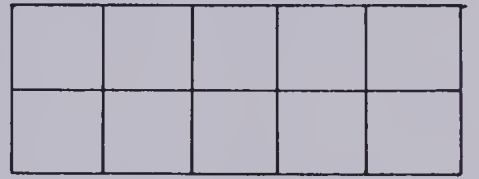
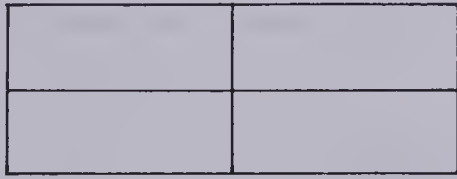
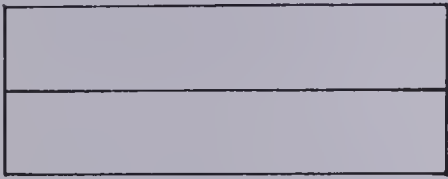
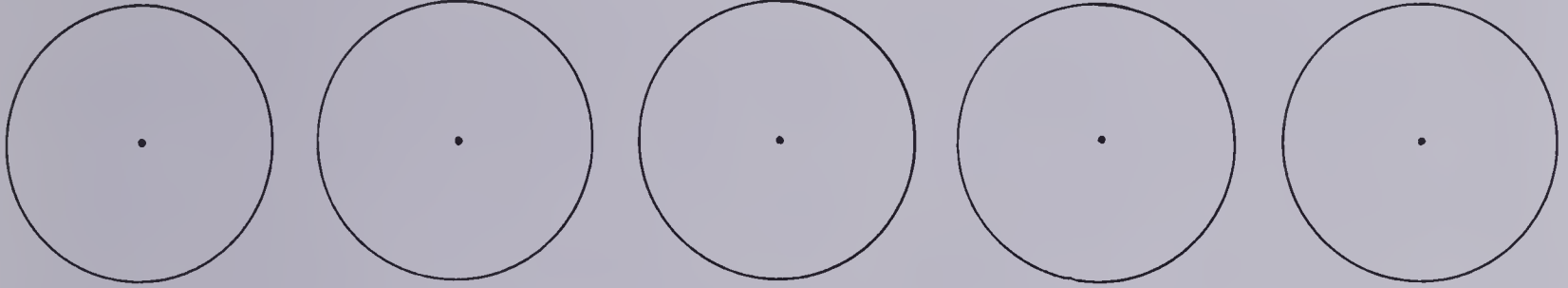
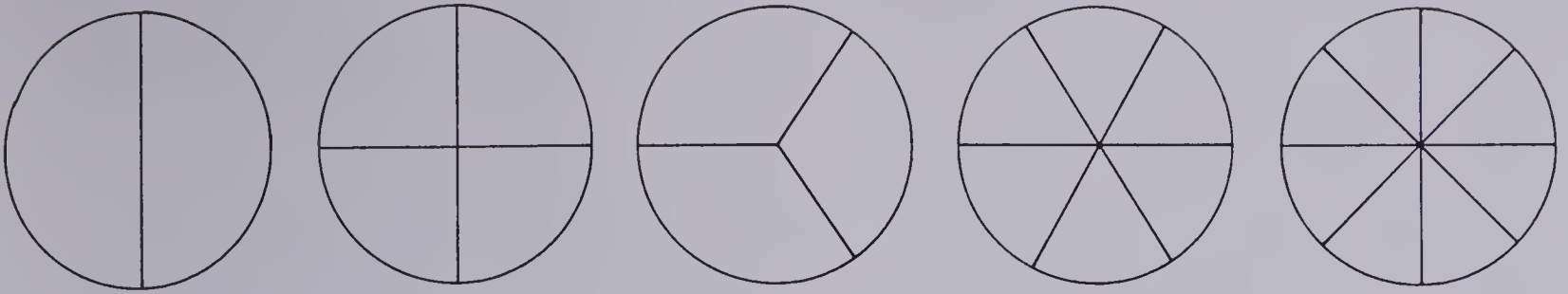


# UNIT 14

## Decimals

Theme: Number Machines

Lesson		Objective	Pages
Preview		Review addition and subtraction skills.	309
1	N14	Write hundredths using decimal notation.	310-311
2	N15	Write and compare decimals in hundredths equal to or greater than one.	312-313
3	N16	Regroup tenths and hundredths.	314-315
4	A66	Add hundredths.	316-317
5	A67	Subtract hundredths.	318-319
6	PS15	Solve problems involving adding and subtracting tenths and hundredths.	320-321
7	M21	Express linear measure to the nearest tenth and hundredth.	322-323
8	A68	Add and subtract fractions with like denominators.	324-325
9	A69	Change fractions to decimals.	326-327
Test		Decimals	328
Review		Graphs	329







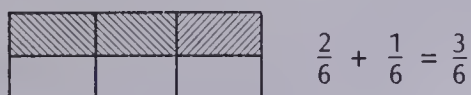
# About This Unit

The purpose of this unit is

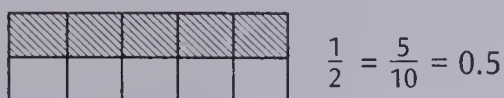
1. to extend decimals to hundredths,
2. to apply knowledge of tenths and hundredths to exact metric measurements,
3. to relate fractions and decimals.

Much of the work of this unit is an extension of Unit 7, Fractions and Decimals. In Unit 7, fractional parts of a whole and of a set, equivalent fractions, and the comparing of fractions were studied. Pictures were used to develop fractional concepts. In Unit 14, the pictorial approach to fractions is again used as the students add and subtract fractions with like denominators and as the students change fractions to decimals.

- a. add and subtract fractions



- b. change fractions to decimals



In Unit 7, the students learned the meaning of tenths, how to write tenths as a fraction and as a decimal, pictured decimals greater than one in tenths, compared tenths, and added and subtracted tenths. Tenths were applied also to the metric system as students learned that a centimetre is a tenth of a decimetre and that a decimetre is a tenth of a metre.

In Unit 14, similar concepts are developed with hundredths. Students first learn to picture hundredths with place-value materials and  $10 \times 10$  grid illustrations. They learn how to write hundredths as a fraction and as a decimal, how to compare hundredths, and how to add and subtract hundredths. The lessons provide many suggestions for “hands on” activities and relate hundredths to real-life situations. Lesson 7 applies hundredths to metric measurement situations. Students learn how to measure to the nearest tenth of a centimetre, tenth and hundredth of a decimetre, and tenth and hundredth of a metre.

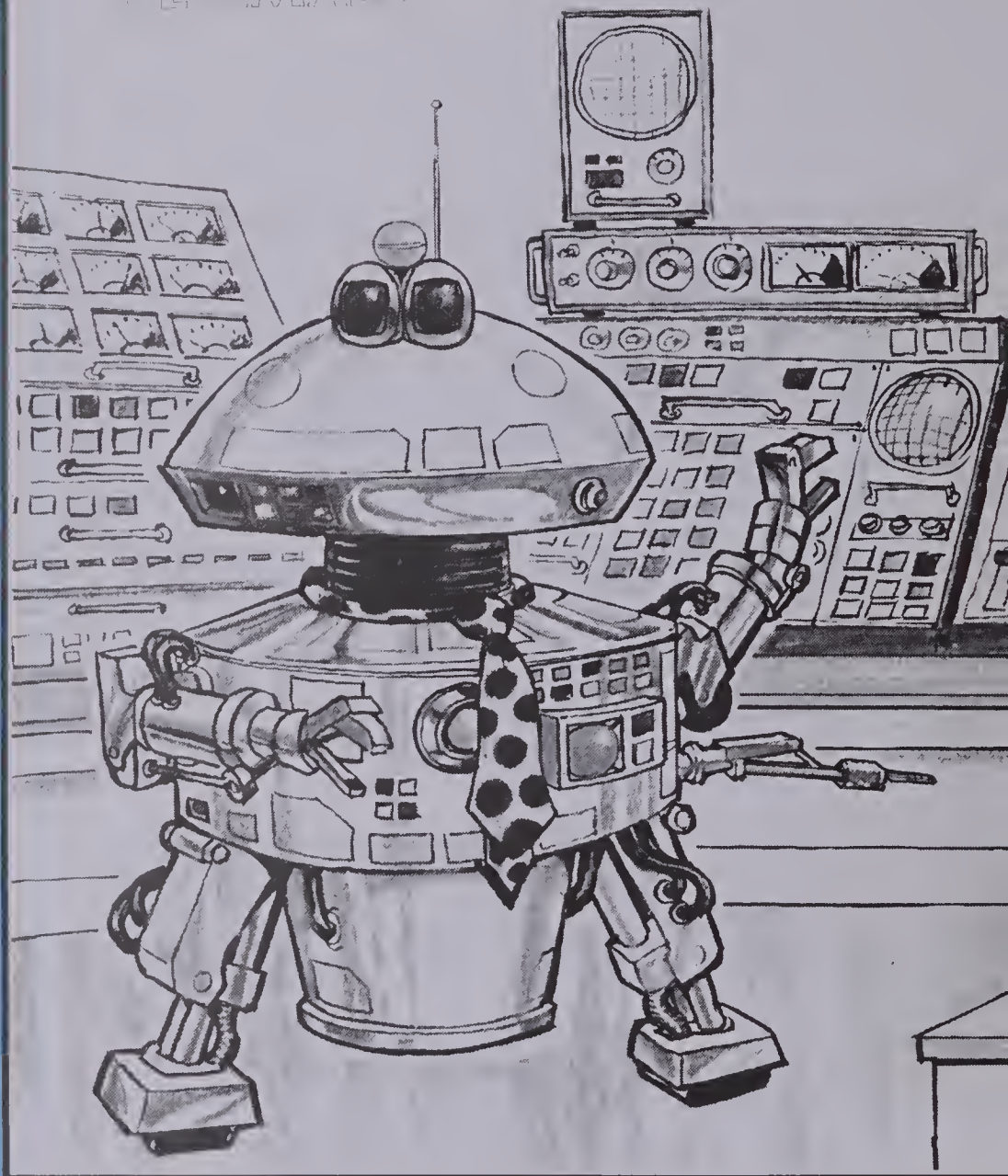
Successful completion of Unit 7 should ensure success with this unit, which in turn should “sow good seeds” for work in the Grade 5 book.

## Ideas

1. Grow a potato plant, bean plant, ivy plant, etc. in the classroom. Have the students measure its growth periodically in millimetres. Ask the students to express the measures also in centimetres, decimetres, and metres. A point graph, like the one on page 296, can be made to provide a picture of the growth.
2. Play Bingo by having the students find decimal fraction equivalents.

# UNIT 14

THE MATHS



Unit 14 Objectives	Test Questions	Pages
N14	1-6	310-311
N15	7-12	312-313
N16	29-30	314-315
A66	13-16	316-317
A67	17-20	318-319
M21	31-32	322-323
A68	21-28	324-325
A69	33-37	326-327
PS15	38	

## Pretest

## Unit 14

Write as a decimal.

1. 42 hundredths **0.42**

2. 5 hundredths **0.05**

3. 97 hundredths **0.97**

4.  $\frac{3}{100}$  **0.03**

5.  $\frac{15}{100}$  **0.15**

6.  $\frac{70}{100}$  **0.70**

Compare the decimals. Use  $<$ ,  $=$ , or  $>$ .

7. 3.06  **$<$**  3.60

8. 135.09  **$>$**  134.11

9. 7.68  **$>$**  6.87

10. 42.85  **$>$**  42.58

11. 2.0  **$=$**  2

12. 0.8  **$<$**  1

Add or subtract.

$$\begin{array}{r} 13. \quad 2.65 \\ + 4.09 \\ \hline \end{array}$$

**6.74**

$$\begin{array}{r} 14. \quad 27.11 \\ + 9.89 \\ \hline \end{array}$$

**37.00**

$$\begin{array}{r} 15. \quad 371.62 \\ + 5.75 \\ \hline \end{array}$$

**377.37**

$$\begin{array}{r} 16. \quad \$49.65 \\ + 96.28 \\ \hline \end{array}$$

**\$145.93**

$$\begin{array}{r} 17. \quad 8.04 \\ - 2.35 \\ \hline \end{array}$$

**5.69**

$$\begin{array}{r} 18. \quad 37.25 \\ - 8.46 \\ \hline \end{array}$$

**28.79**

$$\begin{array}{r} 19. \quad 204.05 \\ - 35.18 \\ \hline \end{array}$$

**168.87**

$$\begin{array}{r} 20. \quad \$26.87 \\ - 19.89 \\ \hline \end{array}$$

**\$6.98**



Robot H2M2

Help H2M2 find the missing people.

Write the letters of the alphabet in order. Then, counting by tenths, label the letters A = 0.1, B = 0.2, C = 0.3, and so on. Work the problems below. The answers should lead you to the missing people.

LUKE SKYWALKER  
PRINCESS LEIA

1.  $2.7 - 1.5 = 1.2$   
2.  $1.1 + 1.0 = 2.1$   
3.  $8.9 - 7.8 = 1.1$   
4.  $9.7 - 9.2 = 0.5$   
5.  $0.5 + 1.4 = 1.9$   
6.  $7.4 - 6.3 = 1.1$   
7.  $1.4 + 1.1 = 2.5$   
8.  $1.3 + 1.0 = 2.3$   
9.  $4.7 - 4.6 = 0.1$   
10.  $7.1 - 5.9 = 1.2$   
11.  $5.0 - 3.9 = 1.1$   
12.  $6.3 - 5.8 = 0.5$   
13.  $0.9 + 0.9 = 1.8$   
14.  $4.2 - 2.6 = 1.6$   
15.  $1.1 + 0.7 = 1.8$   
16.  $9.3 - 8.4 = 0.9$   
17.  $0.7 + 0.7 = 1.4$   
18.  $7.1 - 6.8 = 0.3$   
19.  $6.2 - 5.7 = 0.5$   
20.  $1.3 + 0.6 = 1.9$   
21.  $1.0 + 0.9 = 1.9$   
22.  $0.5 + 0.7 = 1.2$   
23.  $4.0 - 3.5 = 0.5$   
24.  $8.4 - 7.5 = 0.9$   
25.  $9.0 - 8.9 = 0.1$

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UNIT 14 PREVIEW

Suggestions

Use the illustration on page 308 to start a discussion on the unit theme, number machines. See which kinds of machines the students have used: calculator, adding machine, pedometer, etc. Talk about the uses of machines like computers, odometers, and cash registers in contemporary life.

About the Page

(The examples on page 309 provide a review of adding and subtracting tenths, which was introduced in Unit 7, Lessons 8 and 9, pages 156 to 159. Note that there is a *mixture* of addition and subtraction examples on page 309. Addition and subtraction of tenths was presented separately in the earlier lessons.)

Review the meaning behind adding and subtracting tenths using place-value blocks. Let a rod represent one whole and a cube represent one tenth. Have the students model several examples similar to the following.

a. 
$$\begin{array}{r} 1\text{s} \quad \frac{1}{10}\text{s} \\ + \quad \quad \quad \\ \hline 0.6 \\ +0.5 \\ \hline 1.1 \end{array}$$

b. Take 9 cubes from 2 rods.

Regroup the 2 rods as 1 rod and 10 cubes.

$$\begin{array}{r} 1\text{ 10} \\ 2.0 \\ -0.9 \\ \hline 1.1 \end{array}$$

Point out the directions for finding the missing people. Remind the students to watch the signs as they do the page.

Reinforcement

Work with small groups of students who are having difficulty understanding the meaning behind addition and subtraction of decimals. Use the place-value blocks, as suggested above, or  $10 \times 10$  grids to model the examples.

$$\begin{array}{r} 0.3 \\ +0.4 \\ \hline 0.7 \end{array}$$

21.  $\frac{1}{4} + \frac{2}{4} = \frac{3}{4}$  22.  $\frac{3}{5} + \frac{3}{5} = \frac{6}{5}$  23.  $\frac{6}{10} - \frac{2}{10} = \frac{4}{10}$  24.  $\frac{8}{8} - \frac{7}{8} = \frac{1}{8}$   
25.  $\frac{4}{6} + \frac{1}{6} = \frac{5}{6}$  26.  $\frac{7}{7} - \frac{2}{7} = \frac{5}{7}$  27.  $\frac{2}{3} - \frac{1}{3} = \frac{1}{3}$  28.  $\frac{5}{9} + \frac{4}{9} = \frac{9}{9}$

Regroup.

29. 4 tenths + 2 hundredths = 3 tenths + 12 hundredths  
30. 5 ones + 3 tenths = 4 ones + 13 tenths  
31. 45 mm = 4 cm + 5 mm = 4.5 cm  
32. 214 cm = 2 m + 14 cm = 2.14 m

Write the decimal.

33.  $\frac{1}{10} = 0.1$  34.  $\frac{2}{5} = 0.4$  35.  $\frac{6}{10} = 0.6$  36.  $\frac{4}{5} = 0.8$  37.  $\frac{1}{2} = 0.5$

Solve.

38. Mr. Rafferty used two cans of paint to cover the walls of his living room and dining room. Each can held 4.54 L of paint. How much paint did he use? 9.08 L



# UNIT 14 LESSON 1

## Objective N14

Write hundredths using decimal notation.

## Introducing the Lesson

Give each student a worksheet having several  $10 \times 10$  grids. "How many columns are in a grid?" *Ten*. "Each column is what part of the grid?" *One tenth*. Have the students colour grid columns to represent 0.4, 0.1, and 0.9. Point out that the coloured parts of the grid can be written as fractions and as decimals, e.g.,  $0.4 = \frac{4}{10}$ .

## Teaching the Lesson

Ask the students to tell how many squares there are on the 10 by 10 grid. Have them colour only one square on a grid and then tell the fractional part that is coloured. The students should conclude that one out of a hundred, or  $\frac{1}{100}$ , is coloured. Show them that this can also be written as 0.01. Illustrate the place value of 0.01 with the following chalkboard chart. Explain how the zeros represent zero ones and zero tenths.

1s	$\frac{1}{10}$ s	$\frac{1}{100}$ s
0	0	1

Point out the hundredths illustrations at the top of page 310. Have the students model several other decimals in hundredths on 10 by 10 grids. Show how each example can be written as a fraction or as a decimal.

Display play dollar bills, dimes, and pennies. Ask, "What fraction of a dollar is a dime? a penny?" Relate money notation to place-value concepts.

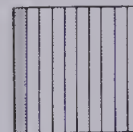
a dime = \$0.10      a penny = \$0.01

Show a metre stick. Explain how  $1 \text{ cm} = 0.01 \text{ m}$ . Have the students name how much of a metre is 7 cm, 19 cm, 35 cm, 60 cm, and 99 cm.

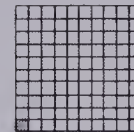
## Hundredths



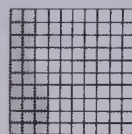
one  
1      1.0



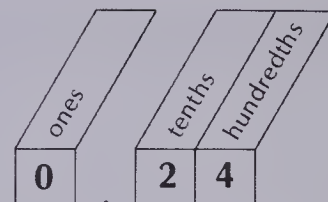
one tenth  
 $\frac{1}{10}$       0.1



one hundredth  
 $\frac{1}{100}$       0.01

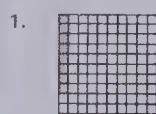


twenty-four hundredths  
 $\frac{24}{100}$       0.24



## EXERCISES

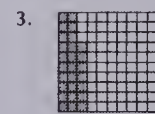
Complete.



8 hundredths



52 hundredths



28 hundredths

4.  $0.14 = \frac{14}{100}$  hundredths

5.  $0.82 = \frac{82}{100}$  hundredths

6.  $0.60 = \frac{60}{100}$  hundredths

7.  $0.03 = \frac{3}{100}$  hundredths

Write as a decimal.

8. 25 hundredths 0.25

9. 69 hundredths 0.69

10. 15 hundredths 0.15

11. 8 hundredths 0.08

12. 50 hundredths 0.50

13. 2 hundredths 0.02

14.  $\frac{26}{100}$  0.26

15.  $\frac{91}{100}$  0.91

16.  $\frac{44}{100}$  0.44

17.  $\frac{80}{100}$  0.80

18.  $\frac{3}{100}$  0.03

Which decimal is larger?

19. 0.37 or 0.73

20. 0.09 or 0.20

21. 0.54 or 0.52

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## Using the Exercises

- Questions 1 to 18 involve illustrations of the meaning of hundredths and practice in both reading and writing hundredths.
- Questions 19 to 21 involve comparing hundredths. See that the students compare the digits in the largest place first.

0.37      0.73

Compare the ones.       $0 = 0$

Compare the tenths.       $3 < 7$

So,  $0.37 < 0.73$

## Practice

Write as a fraction.

1. 0.12  $\frac{12}{100}$  2. 0.07  $\frac{7}{100}$  3. 0.83  $\frac{83}{100}$  4. 0.61  $\frac{61}{100}$  5. 0.50  $\frac{50}{100}$

Write the decimal

6. 14 hundredths  $0.14$  7. 3 hundredths  $0.03$  8. 65 hundredths  $0.65$   
 9. 91 hundredths  $0.91$  10. 70 hundredths  $0.70$  11. 5 hundredths  $0.05$   
 12.  $\frac{94}{100}$   $0.94$  13.  $\frac{42}{100}$   $0.42$  14.  $\frac{6}{100}$   $0.06$  15.  $\frac{25}{100}$   $0.25$  16.  $\frac{14}{100}$   $0.14$

Write using \$ and ¢.

17. 35¢  $\$0.35$  18. 16¢  $\$0.16$  19. 48¢  $\$0.48$  20. 5¢  $\$0.05$  21. 75¢  $\$0.75$

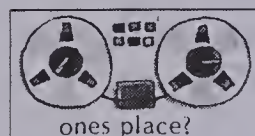
Which decimal is larger?

22. 0.20 or 0.02  $0.20$  23. 0.41 or 0.04  $0.41$  24. 0.07 or 0.12  $0.12$

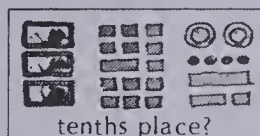
Write each length in metres

25. 54 cm  $0.54$  26. 28 cm  $0.28$  27. 61 cm  $0.61$  28. 9 cm  $0.09$  29. 73 cm  $0.73$   
 30. 50 cm  $0.50$  31. 90 cm  $0.90$  32. 1 cm  $0.01$  33. 10 cm  $0.10$  34. 100 cm  $1.00$

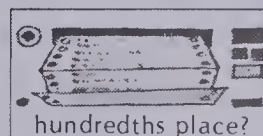
## Place Values



32	2
35.6	5
5.74	5
162	2
7.03	7



2.0	0
63.5	5
7.45	4
0.03	0
12.4	4

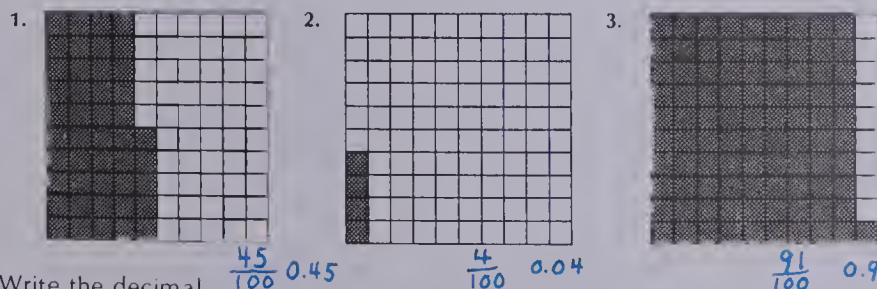


0.06	6
0.76	6
3.12	2
1.401	0
0.08	8

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## Extra Practice

Write the fraction and the decimal.



Write the decimal.

4. 1 hundredth  $0.01$  5. 19 hundredths  $0.19$  6. 90 hundredths  $0.90$

7.  $\frac{16}{100}$   $0.16$  8.  $\frac{37}{100}$   $0.37$  9.  $\frac{2}{100}$   $0.02$  10.  $\frac{50}{100}$   $0.50$  11.  $\frac{5}{100}$   $0.05$

Write using \$ and ¢.

12. 42¢  $\$0.42$  13. 8¢  $\$0.08$  14. 95¢  $\$0.95$  15. 11¢  $\$0.11$  16. 3¢  $\$0.03$

## Worksheet N14

Pages 310-311

## Assigning the Practice

Minimum: 1-24

Average: 4-34

Enriched: 4-34

## Reinforcement

1. Assign *Place Values* at the bottom of page 311.

2. Prepare a set of Dominoes using fractional and decimal equivalents.

Have the students play Dominoes by matching the equivalents.

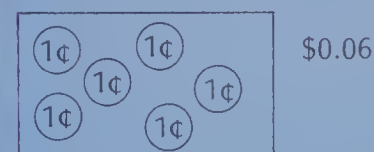
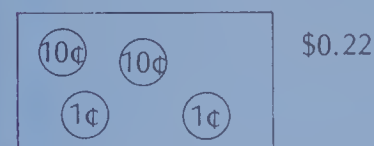
$\frac{8}{100}$	$\frac{37}{100}$
-----------------	------------------

$\frac{6}{100}$	0.08
-----------------	------

0.37	$\frac{98}{100}$
------	------------------

3. Show the class pieces of yarn cut into various lengths of even centimetres (under 100 cm). Have them measure and record the lengths in metres.

4. Prepare cards having dimes and pennies stamped on them to amounts under \$1.00 as shown below. Have the students write how much money is represented on each card using a dollar sign and cents point.



## Enrichment

Have the students recall that 10 cm = 1 dm and 10 mm = 1 cm. Then ask them to complete the following.

- a. 1 cm = ■ mm b. 5 mm = ■ cm  
 c. 24 mm = ■ dm d. 8 dm = ■ mm  
 e. 58 mm = ■ dm f. 7 mm = ■ dm  
 g. 20 dm = ■ mm h. 1 mm = ■ dm

# UNIT 14 LESSON 2

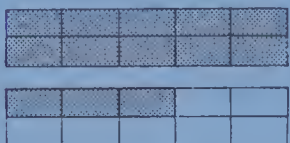
## Objective N15

Write and compare decimals in hundredths equal to or greater than one.

## Introducing the Lesson

Review decimals in tenths greater than or equal to one with the following kinds of illustrations.

a.   $\frac{10}{10}$  or 1.0

b.   $\frac{13}{10}$  or 1.3

## Teaching the Lesson

Discuss the lesson examples at the top of page 312. Show similar grids on an overhead projector which are shaded to illustrate decimals in hundredths greater than one. Ask the students to give the fraction and decimal for each. Point out how the word *and* is said at the decimal point, e.g., 4.05 is read four *and* five hundredths.

Point out the place-value chart at the top of page 312. Explain how each place is ten times greater than the one to its right.

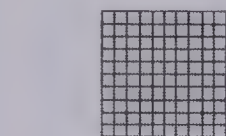
10 hundredths = 1 tenth

10 tenths = 1 whole

Set out several piles of pennies (105, 225, 310, etc.). Have the students count them, group them into hundreds, and then write the amount of money for each.

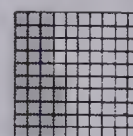
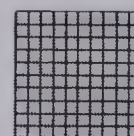
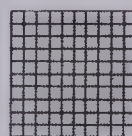
Measure the height of a few students in even centimetres. Record the measurements on the chalkboard. Then ask the class to express these heights in metres. Have the students write comparison statements about these heights using  $<$ ,  $=$ , or  $>$ .

## Decimals Greater Than 1



one hundred hundredths

$$\frac{100}{100} \quad 1.00$$

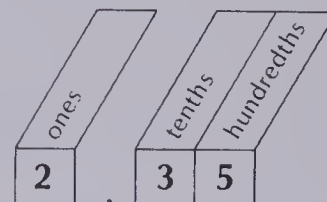


two hundred thirty-five hundredths

$$\frac{235}{100} \quad 2.35$$

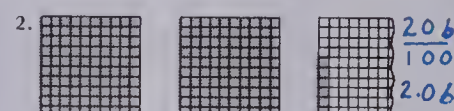
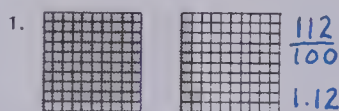
Read 2.35 as

two *and* thirty-five hundredths



## EXERCISES

Write the fraction and the decimal that tell how much is shaded.



Complete

3. 4 <sup>18</sup>/<sub>100</sub> = 4 and <sup>18</sup>/<sub>100</sub> hundredths  
4. 27.35 = 27 and <sup>35</sup>/<sub>100</sub> hundredths  
5. 91 <sup>05</sup>/<sub>100</sub> = 91 and <sup>5</sup>/<sub>100</sub> hundredths  
6. 42.40 = <sup>42</sup>/<sub>100</sub> and <sup>40</sup>/<sub>100</sub> hundredths

Write as a decimal

7. 57 hundredths 0.57  
8. 2 and 15 hundredths 2.15  
9. 14 and 39 hundredths 14.39  
10. 28 and 7 hundredths 28.07

Compare the decimals Use  $>$ ,  $<$ , or  $=$  for  $\blacksquare$

11. 0.06  $\blacksquare$  0.09  
12. 8.06  $\blacksquare$  8.09  
13. 8.16  $\blacksquare$  8.19  
14. 2.61  $\blacksquare$  8.01  
15. 4.78  $\blacksquare$  3.78  
16. 4.18  $\blacksquare$  4.81

312

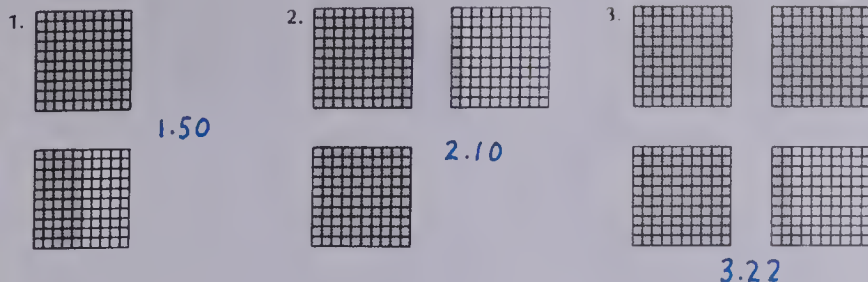
## Using the Exercises

- Questions 1 to 10 provide various kinds of practice in writing decimals greater than one. For questions 7 to 10, point out how the word "and" denotes where the decimal point goes. 2 *and* 15 hundredths, or 2.15
- Questions 11 to 16 involve comparing decimals in hundredths greater one. Remind the students to compare the digits in the largest place first.  
8.06    8.09  
Compare the ones.    8 = 8  
Compare the tenths.    0 = 0  
Compare the hundredths    6 < 9  
So, 8.06 < 8.09



## PRACTICE

Write the decimal that tells how much is shaded.



Write as a decimal.

4. 42 hundredths **0.42**  
 5. 2 and 51 hundredths **2.51**  
 6. 23 and 4 hundredths **23.04**  
 7. 180 and 70 hundredths **180.70**  
 8. 16 and 50 hundredths **16.50**  
 9. 298 and 3 hundredths **298.03**

Compare the decimals. Use  $>$ ,  $<$ , or  $=$  for  $\blacksquare$ .

10. 53.19  $\blacksquare$  53.18  
 11. 90.21  $\blacksquare$  92.01  
 12. 16.85  $\blacksquare$  16.85  
 13. 123.51  $\blacksquare$  123.49  
 14. 29.04  $\blacksquare$  29.40  
 15. 26.3  $\blacksquare$  26.30

Write the decimals in order, from smallest to largest

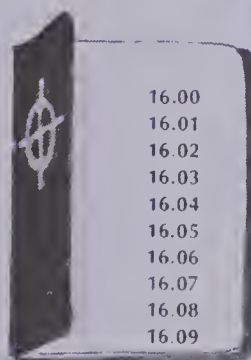
16. **0.09, 0.14, 0.20, 0.22, 0.32, 0.36, 0.40**  
 17. **0.07, 0.17, 0.19, 0.27, 0.79, 0.90, 0.97**

## Super Saver

As Dino saves each cent in his bank, he writes the total in a record book. At the beginning of this month he had \$16.00. Now he has \$17.00. How many 6's did Dino write in his record book? **120**

Hints:

- How many of the 6s were in the ones place? **100**  
 How many of the 6s were in the tenths place? **10**  
 How many of the 6s were in the hundredths place? **10**



313

## Assigning the Practice

Minimum: 1-15

Average: 3-17

Enriched: 3-17

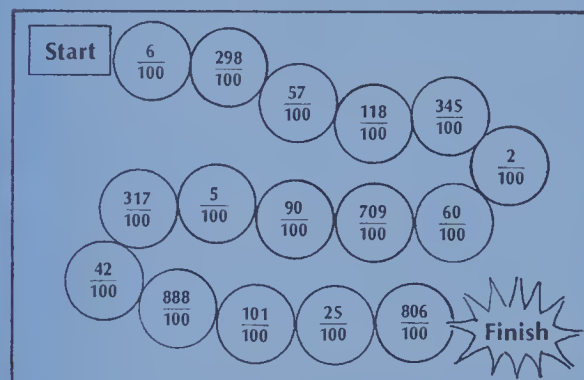
## Reinforcement

1. Ask the students to write the decimal.

- a. 6 ones + 3 tenths + 1 hundredth  
 b. 9 ones + 0 tenths + 4 hundredths  
 c. 7 ones + 2 tenths + 0 hundredths  
 d. 8 tens + 4 ones + 3 tenths + 5 hundredths  
 e. 6 tens + 5 ones + 1 tenth + 8 hundredths

2. Have the students measure the length of one side of the classroom (chalkboard, hallway, etc.) in metres.

3. Make a game board as shown below. Write fractions in hundredths on the circles of the path. To play the game, players must, in turn, roll a die and move ahead the number of spaces indicated on the die. The player must then write the decimal equivalent of the fraction landed on for all to see and check. The first player to reach Finish is the winner.



## Extra Practice

Write the decimal.

1.  $\frac{100}{100}$  **1.00** 2.  $\frac{216}{100}$  **2.16** 3.  $\frac{246}{100}$  **2.46** 4.  $\frac{405}{100}$  **4.05** 5.  $\frac{119}{100}$  **1.19**  
 6. 3 and 46 hundredths **3.46** 7. 5 and 17 hundredths **5.17**  
 8. 9 and 1 hundredth **9.01** 9. two hundred hundredths **2.00**

Write using \$ and ¢.

10. 6¢ **\$0.06** 11. 162¢ **\$1.62** 12. 395¢ **\$3.95** 13. 226¢ **\$2.26** 14. 508¢ **\$5.08**

Write each length in metres.

15. 216 cm **2.16 m** 16. 309 cm **3.09 m** 17. 150 cm **1.50 m** 18. 442 cm **4.42 m** 19. 202 cm **2.02 m**

## Worksheet N15

Pages 312-313

## Enrichment

Assign *Super Saver* at the bottom of page 313. This activity demonstrates the importance of place value in distinguishing numbers. If students use a pattern for the last three questions, they should be able to find the answers. Have the students count by hundredths, if necessary, until they are sure.

# UNIT 14 LESSON 3

## Objective N16


Regroup tenths and hundredths.

### Introducing the Lesson

Review the use of the place-value blocks to represent ones, tenths, and hundredths. Show a flat as representing one whole. Ask, "What would a rod represent?" *One tenth.* "What would a cube represent?" *One hundredth.*

Illustrate several decimals similar to the following with the place-value blocks. Ask the students to name the decimal.

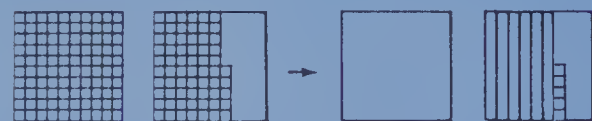
a.  2 tenths + 3 hundredths  
0.23

b.  1 one + 4 tenths + 4 hundredths  
1.44

### Teaching the Lesson

Point out the two kinds of machines at the top of page 314, Rewriter and Regrouper. Show how each machine works with the place-value blocks. Explain that Rewriter makes numbers like 15 hundredths easier to understand. Show a 10 cm × 10 cm flat. Point out how a rod can be placed over a strip of ten centimetres, thus renaming 15 hundredths as 1 tenth + 5 hundredths.

Have the students also take turns demonstrating how examples like the following can be rewritten in a more understandable way.



165 hundredths →

1 one + 6 tenths + 5 hundredths

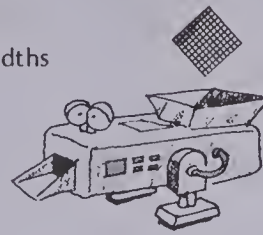
Explain how the Regrouper machine also works with place-value blocks. Show that this process helps you to add and to subtract. Have the students demonstrate examples with place-value blocks.

## Regrouping Tenths and Hundredths

Rewriter is a robot.

He rewrites a number so you can understand it.

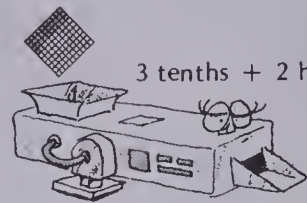
15 hundredths



= 1 tenth + 5 hundredths  
= 0.15

Regrouper is another robot.

She regroupes a number so you can subtract or add.



3 tenths + 2 hundredths

= 2 tenths + 12 hundredths

### EXERCISES

Rewrite each decimal.

- 56 hundredths = <sup>5</sup> tenths + <sup>6</sup> hundredths = 0.56
- 31 hundredths = <sup>3</sup> tenths + <sup>1</sup> hundredth = 0.31
- 100 hundredths = <sup>1</sup> ones + <sup>0</sup> tenths + <sup>0</sup> hundredths = 1.00
- 136 hundredths = <sup>1</sup> ones + <sup>3</sup> tenths + <sup>6</sup> hundredths = 1.36
- 34 tenths = <sup>3</sup> ones + <sup>4</sup> tenths = 3.4
- 76 tenths = <sup>7</sup> ones + <sup>6</sup> tenths = 7.6
- 6 tenths = <sup>0</sup> ones + <sup>6</sup> tenths = 0.6

Regroup each decimal.

- 5 tenths + 3 hundredths = 4 tenths + <sup>13</sup> hundredths
- 8 tenths + 1 hundredth = 7 tenths + <sup>11</sup> hundredths
- 6 tenths + 4 hundredths = <sup>1</sup> tenth + 14 hundredths
- 2 ones + 7 tenths = <sup>2</sup> ones + <sup>17</sup> tenths
- 9 ones + 2 tenths = <sup>9</sup> ones + <sup>12</sup> tenths
- 12 hundredths = <sup>1</sup> tenth + 2 hundredths
- 13 tenths = <sup>1</sup> ones + <sup>3</sup> tenths
- 37 tenths = <sup>3</sup> ones + <sup>7</sup> tenths

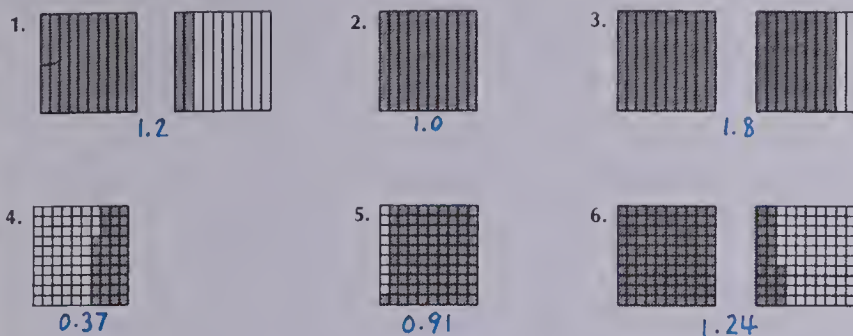
314

### Using the Exercises

- Questions 1 to 7 involve rewriting numbers so that they are easier to understand. Some students may need to use the place-value materials for these.
- Questions 8 to 15 involve regrouping numbers for subtraction (questions 8 to 12) and for addition (questions 13 to 15). Demonstrate a few of these with place-value materials.

## PRACTICE

Write the decimal.

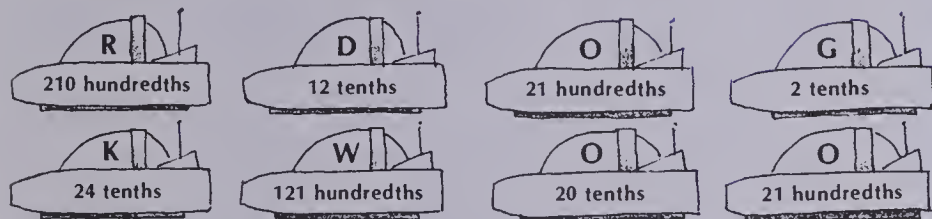


Write the decimal.

	ones	tenths	hundredths	decimal
7.	0	0	16	0.16
8.	0	14	0	1.40
9.	0	9	17	1.07
10.	1	13	6	2.36
11.	4	18	11	5.91
12.	2	10	100	4.00

## Order, Please

Put the numbers in order from smallest to largest. The letters will tell you if you have done it correctly.



0.2 0.21 0.21 1.2 1.21 2.0 2.1 2.4  
G O O D W O R K

315

## Extra Practice

Rewrite each decimal.

- 127 hundredths = 1 ones + 2 tenths + 7 hundredths = 1.27
- 425 hundredths = 4 ones + 2 tenths + 5 hundredths = 4.25
- 89 tenths = 8 ones + 9 tenths = 8.9
- 5 tenths = 0 ones + 5 tenths = 0.5

Regroup each decimal.

- 3 tenths + 7 hundredths = 2 tenths + 17 hundredths
- 8 tenths + 9 hundredths = 7 tenths + 19 hundredths
- 5 ones + 6 tenths = 4 ones + 16 tenths
- 8 ones + 5 tenths = 7 ones + 15 tenths

## Worksheet N16

Pages 314-315

## Assigning the Practice

Minimum: 1-12

Average: 1-12

Enriched: 1-12

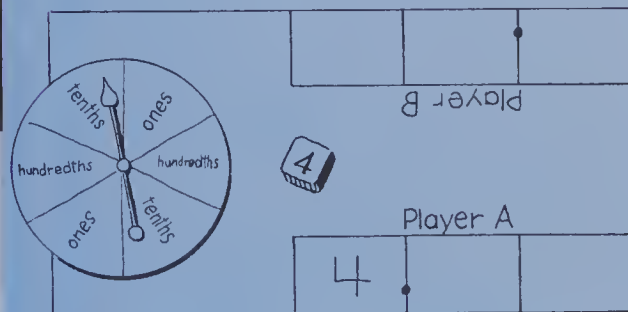
## Reinforcement

1. Assign *Order, Please* at the bottom of page 315.

2. Give the students place-value blocks to complete the following exercise.

- 5 tenths + 2 hundredths =  
4 tenths + 2 hundredths
- 8 tenths + 6 hundredths =  
7 tenths + 1 hundredths
- 3 ones + 6 tenths + 1 hundredth =  
2 ones + 6 tenths + 1 hundredth
- 5 ones + 9 tenths + 4 hundredths =  
5 ones + 8 tenths + 4 hundredths
- 7 ones + 2 tenths + 8 hundredths =  
6 ones + 2 tenths + 8 hundredths

3. Make a game board as shown below. Players, in turn, roll a die marked with the numerals from 4 to 9 and spin the spinner. The number is then entered in the correct spot on the game board. If a player spins a spot which has already been used, it is the next player's turn. After five turns, the player with the largest number gets two points. Another series of five turns is repeated. The game is over when one player gets ten points in all to win.



## Enrichment

Have the students order these numbers from smallest to largest: 46 ones, 25 tens, 948 tenths, 9975 hundredths, 820 ones, 874 hundredths, 92 tens, and 235 tenths.



# UNIT 14 LESSON 4

## Objective A66

Add hundredths.

## Introducing the Lesson

Review expressing amounts of centimetres as metres. Draw the following line segment lengths on the chalkboard. Point out their measure in centimetres and in metres.

a. 175 cm      b. 232 cm      c. 305 cm

## Teaching the Lesson

Hold up a length of yarn which measures 2.3 m. Cut the yarn into 1.25 m and 1.05 m pieces. Ask, "How long was the yarn at first?" Once it has been decided that measuring and adding are needed to answer the question, have two students measure the length of each piece in metres. Record the measures on the chalkboard so they can be added easily. Discuss how the place values are aligned as the decimal points are lined up. Stress the regrouping of hundredths that is needed.

1s	•	$\frac{1}{10}$ s	$\frac{1}{100}$ s
1	•	2	5
+1	•	0	5
2	•	3	0

Have ready several other lengths of yarn. Cut them into two or three pieces and ask the students to measure the pieces in metres and then add to find their original lengths. Point out the proper alignment and regrouping needed for each example.

Read and discuss the top of page 316 to summarize the procedure for adding hundredths.

## Adding Hundredths

Elizabeth used the adding machine in her mother's store to add 25.74 and 41.68. Then she wondered if she could do it by herself.



Keep the

decimal points  
in a line.

Add  
hundredths.

Add  
tenths.

Add  
ones.

Add  
tens.

$$\begin{array}{r} 25.74 \\ +41.68 \\ \hline \end{array}$$

$$\begin{array}{r} 1 \\ 25.74 \\ +41.68 \\ \hline 2 \end{array}$$

$$\begin{array}{r} 11 \\ 25.74 \\ +41.68 \\ \hline .42 \end{array}$$

$$\begin{array}{r} 11 \\ 25.74 \\ +41.68 \\ \hline 7.42 \end{array}$$

$$\begin{array}{r} 11 \\ 25.74 \\ +41.68 \\ \hline 67.42 \end{array}$$

To add decimals:

Keep place values aligned by lining up the decimal points. Then add.

## EXERCISES

Add.

- $5.23 + 4.13 = 9.36$
- $57.24 + 30.15 = 87.39$
- $72.63 + 15.20 = 87.83$
- $93.66 + 4.32 = 97.98$
- $631.45 + 237.12 = 868.57$
- $3.08 + 2.61 = 5.69$
- $4.50 + 1.27 = 5.77$
- $6.25 + 2.71 = 8.96$
- $7.94 + 1.23 = 9.17$
- $3.65 + 4.27 = 7.92$
- $47.93 + 20.35 = 68.28$
- $62.56 + 12.67 = 75.23$
- $50.38 + 30.92 = 81.30$
- $87.45 + 2.33 = 89.78$
- $4.71 + 25.03 = 29.74$
- $82.5 + 6.03 = 88.53$
- $63.69 + 7.42 = 71.11$
- $407.39 + 48.91 = 456.30$
- $82.89 + 13.57 = 96.46$
- $4.86 + 6.17 = 11.03$
- $1.57 + 28.97 = 30.54$

## Using the Exercises

- Questions 1 to 8 involve adding hundredths without regrouping. See that the students properly align the horizontal examples.
- Questions 9 to 21 involve adding hundredths with regrouping.

## PRACTICE

Add.

1.  $3.58 + 2.47 = 6.05$
2.  $41.29 + 13.04 = 54.33$
3.  $32.68 + 24.75 = 57.43$
4.  $43.35 + 51.89 = 95.24$
5.  $65.18 + 10.95 = 76.13$
6.  $28.63 + 10.35 = 38.98$
7.  $20.93 + 52.67 = 73.60$
8.  $16.44 + 2.88 = 19.32$
9.  $51.49 + 26.83 = 78.32$
10.  $73.21 + 20.99 = 94.20$
11.  $9.38 + 60.62 = 70.00$
12.  $324.25 + 100.75 = 425.00$
13.  $587.64 + 11.67 = 599.31$

Solve.

14. Claude's father bought him a calculator for \$39.95. He bought himself a calculator with a time signal for \$59.95. How much did he pay for the two calculators?  $\$99.90$
15. Colette bought an eight-track tape for \$5.99 and two records at \$7.49 each. How much money did she spend altogether?  $\$20.97$
16. Ted timed his run. The first lap took him 45.08 seconds. The second lap took 45.20 seconds. The third lap took 41.15 seconds. What was his total time?  $2 \text{ min } 11.43 \text{ s}$

## Reverse the Digits

The digits of one of the numbers in each row have been reversed. Use a calculator to help you find the "backward" number.

- a.  $28.63 + 40.14 + 50.72 = 120.39$   $40.14 \rightarrow 41.04$
- b.  $45.06 + 34.82 + 19.01 = 90.79$   $19.01 \rightarrow 10.91$
- c.  $15.36 + 79.98 + 28.41 = 133.74$   $79.98 \rightarrow 89.97$
- d.  $26.83 + 11.76 + 25.46 = 75.84$   $26.83 \rightarrow 38.62$

317

## Assigning the Practice

Minimum: 1-8, 14-15

Average: 6-13, 14-15

Enriched: 7-16

## Reinforcement

1. Assign *Reverse the Digits* at the bottom of page 317. This activity provides practice in estimating sums. It can also be done without a calculator.

2. Ask the students to measure the length and width of the classroom, chalkboard, hallway, etc. to find their perimeters.

3. Use a restaurant menu or a take-out food advertisement. Ask the students to select meals for one, two, and four people and then to find the cost.

## Enrichment

Have the students measure and record their heights in metres. Then they can prepare a bar graph of the heights measured. Display the results.

## Extra Practice

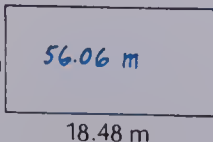
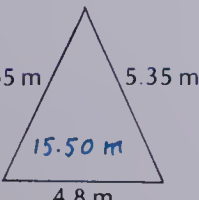
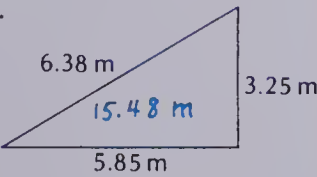
## Worksheet A66

Pages 316-317

Add.

1.  $1.45 \text{ m} + 3.58 \text{ m} = 5.03 \text{ m}$
2.  $72.18 \text{ m} + 16.95 \text{ m} = 89.13 \text{ m}$
3.  $4.28 \text{ L} + 7.67 \text{ L} = 11.95 \text{ L}$
4.  $14.65 \text{ L} + 18.50 \text{ L} = 33.15 \text{ L}$
5.  $64.37 + 2.85 = 67.22$
6.  $28.94 + 50.39 = 79.33$
7.  $603.08 + 71.92 = 675.00$
8.  $8.67 + 95.84 = 104.51$

Find the perimeters.

9. 
10. 
11. 

Objective A67

Subtract hundredths.

Introducing the Lesson

Review regrouping skills needed for subtraction with directions and examples similar to:

- a. "Regroup the tenths so there are more hundredths."

2 11  
4.31 4.~~3~~1

- b. "Regroup the ones so there are more tenths."

5 14  
56.43 5~~6~~.43

Teaching the Lesson

Measure the armspans and heights of a few students in metres. List the information on the chalkboard. Use the measurements to devise comparison subtraction problems, e.g., "How much longer is John's armspan than Bill's?" "What is the difference between Janet's height and armspan?" As the questions are answered, record the subtractions on the chalkboard, discussing the regrouping process and the importance of aligning decimal points.

Read and discuss the lesson example at the top of page 318. Talk about how errors are made in subtraction when we write with a paper and pencil and when we use a calculator.

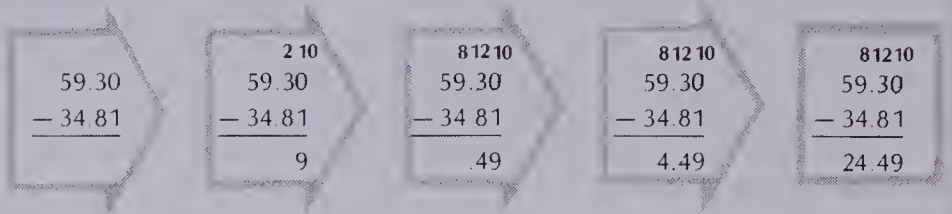
Ask two students to come to the front. Give one a piece of chalk and the other a calculator to do a subtraction involving hundredths. Repeat, with several pairs of students. Emphasize the importance of accuracy, pointing out that neither way is mistake-proof.

Subtracting Hundredths

Chang subtracted 34.81 from 59.30 on his hand calculator. He got 25.49. Chang thought he had made a mistake. He checked his work with paper and pencil. Was he right?



Keep the decimal points in a line. Subtract hundredths. Subtract tenths. Subtract ones. Subtract tens.



The correct answer is 24.49.

To subtract decimals:

Keep place values aligned by lining up the decimal points. Then subtract.

EXERCISES

Subtract.

1. $3.75 - 1.24 = 2.51$	2. $9.28 - 1.07 = 8.21$	3. $8.64 - 3.62 = 5.02$	4. $42.87 - 12.43 = 30.44$	5. $86.59 - 35.14 = 51.45$
6. $5.83 - 2.51 = 3.32$	7. $43.77 - 12.01 = 31.76$	8. $89.27 - 26.05 = 63.22$		
9. $4.26 - 2.73 = 1.53$	10. $8.53 - 1.28 = 7.25$	11. $47.35 - 1.51 = 45.84$	12. $74.03 - 9.42 = 64.61$	13. $53.42 - 10.75 = 42.67$
14. $19.95 - 6.95 = 13.00$	15. $24.32 - 3.09 = 21.23$	16. $18.94 - 9.16 = 9.78$		

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Using the Exercises

- Questions 1 to 8 involve subtracting hundredths without regrouping. See that the students align the horizontal problems correctly.
- Questions 9 to 16 involve subtracting hundredths with regrouping.



## PRACTICE

Subtract.

1.  $9.80 - 4.57 = 5.23$
2.  $5.43 - 2.08 = 3.35$
3.  $64.75 - 31.86 = 32.89$
4.  $15.37 - 10.59 = 4.78$
5.  $76.60 - 21.83 = 54.77$
6.  $52.86 - 20.52 = 32.34$
7.  $41.53 - 30.15 = 11.38$
8.  $82.11 - 61.19 = 20.92$
9.  $36.21 - 5.95 = 30.26$
10.  $80.90 - 75.61 = 5.29$
11.  $83.14 - 62.27 = 20.87$
12.  $84.35 - 1.48 = 82.87$
13.  $341.75 - 200.68 = 141.07$

Solve.

14. A radio-controlled robot is on sale for \$26.24. The regular price is \$34.98. How much money is saved by buying the robot at the sale price?  $\$8.74$
15. Mr. Shapiro bought a digital clock for his daughter. It cost \$23.97. He gave the cashier \$30. How much change did he receive?  $\$6.03$

## REVIEW

N14

Write as a decimal.

1. 34 hundredths  $0.34$
2. 7 hundredths  $0.07$
3.  $\frac{80}{100} = 0.80$

N15

Write as a decimal.

4. 6 and 32 hundredths  $6.32$
5. 49 and 3 hundredths  $49.03$

A66

Add.

6.  $4.12 + 3.75 = 7.87$
7.  $74.03 + 21.85 = 95.88$
8.  $32.58 + 25.53 = 58.11$
9.  $72.34 + 9.17 = 81.51$

A67

Subtract.

10.  $7.45 - 2.14 = 5.31$
11.  $73.87 - 11.23 = 62.64$
12.  $57.14 - 13.72 = 43.42$
13.  $69.20 - 5.88 = 63.32$

319

## Assigning the Practice

Minimum: 1-8, 14-15

Average: 6-15

Enriched: 6-15

## Review Exercises

Questions	Objective	Pages
1-3	N14	310-311
4-5	N15	312-313
6-9	A66	316-317
10-13	A67	318-319

## Reinforcement

1. Have available several newspaper food ads. Prepare a list of food items that the students can "shop" for. Ask the students to find the cost of the items and the change received from \$20.00, \$50.00, etc.

2. Ask the students to measure the length in metres of various cars in the parking lot. Then have them use these measurements to devise comparison subtraction problems for the class to solve.

3. Have the students complete the following.

a.

In	Out
Rule: $-6.45$	
30.14	
9.08	
26.44	
40.01	

b.

In	Out
Rule: $-18.78$	
20.53	
34.24	
100.05	
96.11	

## Enrichment

Ask the students to research finishing times in winter Olympic events which are recorded to hundredths of a second for the gold and silver medal winners. Then have them devise subtraction comparison word problems using these times.

## Extra Practice

## Worksheet A67

Pages 318-319

Subtract.

1.  $3.05 \text{ m} - 2.75 \text{ m} = 0.30 \text{ m}$
2.  $57.20 \text{ m} - 29.95 \text{ m} = 27.25 \text{ m}$
3.  $5.24 \text{ L} - 3.16 \text{ L} = 2.08 \text{ L}$
4.  $1.08 \text{ L} - 0.89 \text{ L} = 0.19 \text{ L}$
5.  $68.08 - 35.99 = 32.09$
6.  $81.30 - 20.62 = 60.68$
7.  $79.42 - 58.56 = 20.86$
8.  $4.01 - 3.75 = 0.26$

Solve.

9. Laura saved \$5.00. She spent \$3.69 on a Star Wars action figure. How much money did she have left?  $\$1.31$

UNIT 14 LESSON 6

Objective PS15

Solve problems involving adding and subtracting tenths and hundredths.

Introducing the Lesson

Write the following sets of facts on the chalkboard. After reading and discussing them, ask the students to make up a word problem for each. Write the students' problems on the chalkboard.

Downhill skiing race times:  
Joe: 4:10.05  
Ted: 4:09.85

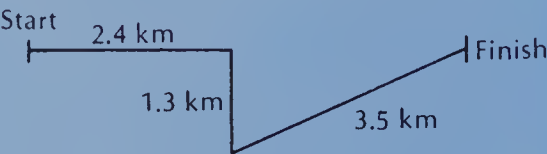
Paint 4.55 L    Paint 4.55 L

Regular price \$29.49  
Discount \$5.50

Go to bed 10:30 p.m.  
Get up 6:45 a.m.

Teaching the Lesson

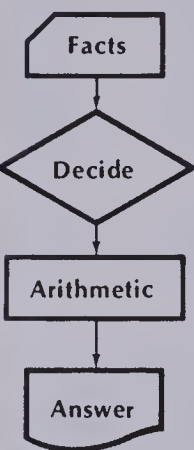
Point out the problem at the top of page 320. Illustrate the situation on the chalkboard. Guide the students through the four problem-solving steps as they decide on the solution.



Use the four problem-solving steps to solve the word problems written earlier on the chalkboard. Have the students sketch the problem situations. Point out key words and phrases that help one to *decide* whether to add or subtract.

Problem Solving

Joe took a pedometer along on a hike. It showed that he walked 2.4 km in one direction, then 1.3 km in another, and finally 3.5 km. How far did Joe walk in all?

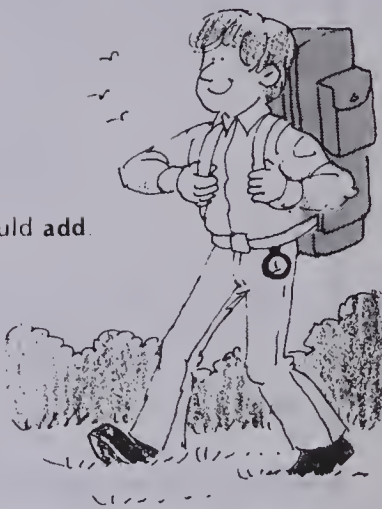
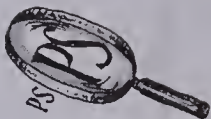


2.4 km in one direction  
1.3 km in another direction  
3.5 km in another direction

To find **how far in all**, you should **add**.

1  
2.4  
1.3  
+ 3.5  
7.2

He walked 7.2 km in all.



EXERCISES

Solve.

- 1. Mr. Cribbs timed Nina's running with a stop watch. At the beginning of the summer, it took her 72.08 seconds to run 400 m. At the end of the summer, it took her 68.50 seconds. By how much did she improve her time? **3.58 seconds**
- 2. Mrs. Sirek was filling her gas tank. When the meter read 26.4 L, she put in 0.8 L more. What did the meter read then? **27.2 L**
- 3. Peter measured 2 bolts with a micrometer. One was 8.27 mm thick. The other bolt was 8.61 mm thick. What was the difference in thickness? **0.34 mm**

Using the Exercises

- Questions 1 to 3 provide practice in solving problems that involve either adding or subtracting decimals. Have the students illustrate the situations, if necessary. Discuss their illustrations and solutions before proceeding with page 321.

## PRACTICE

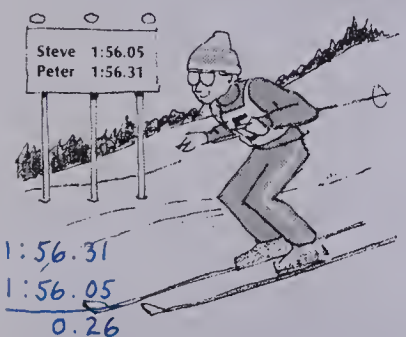
Solve.

- Ms. Hamm bought 2 chairs. The cash register rang up \$64.89 and \$137.95. What total should it show?  $\$202.84$
- The odometer on the Jackson's car read 21 048 km at the start of a trip. At the end of the trip it read 29 721 km. How far did they go?  $8673 \text{ km}$
- June entered 14.6 on her abacus. Then she added 28.7. What number did her abacus show then?  $43.3$
- A digital clock read 16:15 when Terry looked at it. Later it read 16:51. How many minutes had gone by?  $36 \text{ min}$
- Ben used a scale to find the mass of two bags of fruit. One was 5.27 kg and the other was 4.53 kg. What was the total mass of the fruit?  $9.80 \text{ kg}$
- Jake took a pedometer along when he jogged. He jogged 5.6 km on Monday, 4.7 km on Wednesday, and 8.3 km on Friday. How far did he jog that week?  $18.6 \text{ km}$

## Imagine

Use the numbers in the picture to make up a problem. Solve it.

A.



Steve 0.26s faster

B.



cost  $\$0.99 \times 5 = \$4.95$  321

## Extra Practice

## Worksheet PS15

Pages 320-321

Solve.

- In an experiment, the temperature of a piece of metal was  $275.68^{\circ}\text{C}$ . It was cooled to  $21.50^{\circ}\text{C}$ . What was the change in temperature?  $254.18^{\circ}$
- Todd's mass was 35.70 kg last month. This month his mass is 36.25 kg. How much did he gain?  $0.55 \text{ kg}$
- Lunch in the school cafeteria costs \$0.95. How much do 5 lunches cost?  $\$4.75$
- Kim saved \$0.65 one week and \$1.37 the next week. How much did she save in all?  $\$2.02$

## Assigning the Practice

Minimum: 1-6

Average: 1-6

Enriched: 1-6

## Reinforcement

1. Assign *Imagine* at the bottom of page 321.

2. Have the students "go shopping" for gifts for a family member, a school friend, and a neighbour from a department store catalog. Ask them to total the cost of the gifts and to calculate the change they would receive from \$100.00.

## Enrichment

1. Give the students a hardware store catalog. Ask them to cut out pictures of items that are measured in tenths or hundredths and glue them to index cards. Then have them make up a word problem about the items and solve it on the back of the card. The cards can be exchanged with a partner or collected for later use.

2. Ask the students to keep a chart for 5 days showing the exact time (hours and minutes) they went to bed and got up the next morning. Then ask them to compute the number of hours of sleep per night from these times.

Day	I went to bed	I got up	Hours slept
1			
2			
3			
4			
5			

## Problem Solving Activities

Assign Level 4, Unit 13



# UNIT 14 LESSON 7

## Objective M21

Express linear measure to the nearest tenth and hundredth.

## Introducing the Lesson

Review the relationships among the metric units of linear measure as you discuss the following chart.

1 m	1 dm	1 cm	1 mm
10 dm or 100 cm	10 cm	10 mm	

Tape to the chalkboard two metre sticks end-to-end. Above the metre sticks draw a line segment of 1 m and 20 cm. Show the millimetres, centimetres, decimetres, and metres on the metre sticks and have the students count these units to discover the different ways to express the length of the line segment: 1.2 m or 12 dm or 120 cm or 1200 mm.

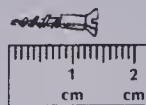
Now draw a line segment which is 1 m and 45 cm long. Have the students name the different ways to express the length: 1.45 m or 14.5 dm or 145 cm or 1450 mm.

## Teaching the Lesson

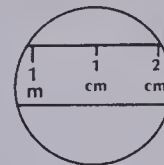
Read and discuss the measurements at the top of page 322. Simulate the measurement of the screw on the overhead projector. Explain that the measurement of 1 cm and 4 mm can be expressed also as 14 mm or 1.4 cm. Explain, also, the ways to express the other measurement given: 1 m and 2 cm or 1.02 m or 102 cm or 10.2 dm or 1020 mm.

Have the students work in small groups. Provide each group with metre sticks, centimetre rulers, and objects of various lengths. Ask the groups to measure the objects' lengths and record each in as many units as they can. When the measuring is done, record their measurements on the chalkboard for discussion.

# Measuring in Tenths and Hundredths



14 mm  
= 1 cm and 4 mm  
= 1.4 cm



102 cm  
= 1 m and 2 cm  
= 1.02 m

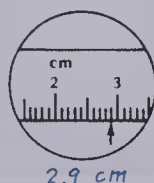
## EXERCISES

Copy and complete.

- 21 mm = 2 cm and 1 mm =  cm **2.1**
- 89 mm = 8 cm and 9 mm =  cm **8.9**
- 40 mm =  cm and  mm = 4.0 cm
- 8 mm =  cm and  mm = 0.8 cm
- 62 mm =  cm and  mm =  cm **6.2**
- 50 mm =  cm and  mm =  cm **5.0**
- 4 mm =  cm and  mm =  cm **0.4**
- 149 cm = 1 m and 49 cm =  m **1.49**
- 356 cm = 3 m and 56 cm =  m **3.56**
- 207 cm =  m and  cm = 2.07 m
- 415 cm =  m and  cm =  m **4.15**
- 68 cm =  m and  cm =  m **0.68**

Write each measure to the nearest tenth of a centimetre.

13.



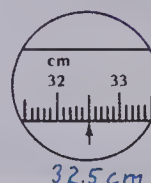
**2.9 cm**

14.



**15.0 cm**

15.



**32.5 cm**

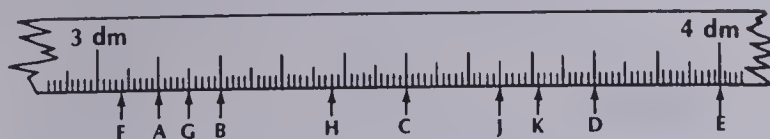
322

## Using the Exercises

- Questions 1 to 7 provide practice in writing measures in tenths. The relationships, 1 cm = 10 mm and 1 mm = 0.1 cm, must be known in order to do these questions.
- Questions 8 to 12 provide practice in writing measures in hundredths. The relationships, 1 m = 100 cm and 1 cm = 0.01 m, must be known in order to do these questions.
- Questions 13 to 15 provide practice in reading measurements to tenths of a centimetre.

## PRACTICE

A ruler was marked in decimetres, centimetres, and millimetres.



Write each measure to the nearest *tenth* of a decimetre.

1. A 3.1 2. B 3.2 3. C 3.5 4. D 3.8 5. E 4.0

Write each measure to the nearest *hundredth* of a decimetre.

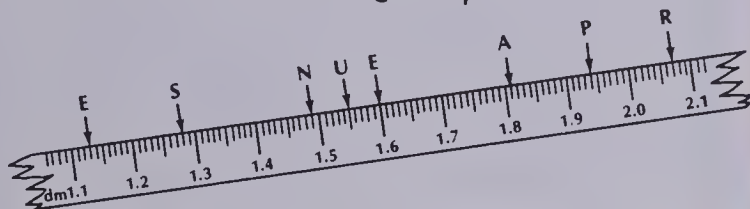
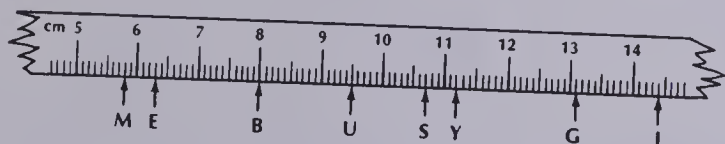
6. F 3.04 7. G 3.15 8. H 3.38 9. J 3.65 10. K 3.71

Copy and complete.

11. 5 m, 3 dm = 5 m 5.3 12. 9 cm, 1 mm = 9 cm 9.1  
 13. 7 m, 4 dm, 1 cm = 7 m 7.41 14. 1 m, 4 cm = 1 m 1.04  
 15. 2 cm, 8 mm = 2 cm 2.8 16. 0 m, 4 dm = 0 m 0.4  
 17. 3 dm, 0 cm, 9 mm = 3 dm 3.09 18. 6 dm, 0 cm = 6 dm 6.0  
 19. 7 m, 0 dm, 0 cm = 7 m 7.00 20. 0 cm, 8 mm = 0 cm 0.8

## Magnifying Measures

Copy the row of numbers on the bottom. Fill in the correct letter for each measure. You will get a message.



11.2 1.13 10.7 14.4 5.8 1.60 1.81 1.28 1.55 2.07 6.3 9.5 1.94 !  
 Y E S I M E A S U R E U R 323

## Assigning the Practice

Minimum: 1-5, 11-20

Average: 1-20

Enriched: 1-20

## Reinforcement

1. Assign *Magnifying Measures* at the bottom of page 323.

2. Have the students measure their height, handspan, forearm, and foot. Ask them to measure each to the nearest tenth of a centimetre, record their measurements in the following kind of chart, and then express their measure in millimetres, decimetres, and metres, also.

	metres	deci- metres	centi- metres	milli- metres
height				
handspan				
forearm				
foot				

3. Tape strips of varying lengths to the floor for the students to measure to the nearest tenth of a centimetre. Then have them express their measures in millimetres, decimetres, and metres as well.

## Enrichment

Have the students prepare length bar graphs of the heights, handspans, forearms, and feet of the students in class.

## Extra Practice

## Worksheet M21

Pages 322-323

Complete.

1. 24 mm = 2 cm + 4 mm 2. 73 mm = 7 cm + 3 mm  
 3. 32 cm = 3 dm + 2 cm 4. 94 cm = 9 dm + 4 cm  
 5. 175 cm = 1 m + 75 cm 6. 428 cm = 4 m + 28 cm  
 7. 1 mm = 0.1 cm 8. 1 cm = 0.1 dm 9. 1 cm = 0.01 m  
 3 mm = 0.3 cm 6 cm = 0.6 dm 42 cm = 0.42 m  
 10 mm = 1.0 cm 10 cm = 1.0 dm 100 cm = 1.00 m

Measure to the nearest tenth of a centimetre.

10. \_\_\_\_\_ 7.5 cm

# UNIT 14 LESSON 8

## Objective A68

Add and subtract fractions with like denominators.

### Introducing the Lesson

Review the meaning of fractions introduced in Unit 7. Show the students a chocolate bar which has, e.g., 8 sections. As you break off sections, ask the students to name the fractional parts that have been broken off so far, e.g.,  $\frac{1}{8}$ ,  $\frac{2}{8}$ ,  $\frac{3}{8}$ , etc.

Review the terms numerator and denominator.

$\frac{3}{8}$  — number of parts described  
8 — number of equal parts in all

### Teaching the Lesson

Show two sections of the chocolate bar and ask the students to name what fractional part of the bar it is. Do the same for three sections. Then put the two and the three sections together. "What fractional part of the chocolate bar is there now?" *Five eighths*. Show the addition equation that corresponds to the action on the chalkboard.

$$\frac{2}{8} + \frac{3}{8} = \frac{5}{8}$$

Devise other addition and subtraction equations with the sections of chocolate bars.

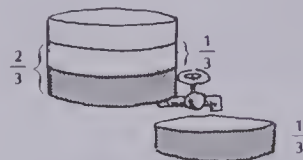
Show the students a package of gum. Take out three of the seven sticks of gum and have the students determine that  $\frac{3}{7}$  of the sticks have been taken out. "What fractional part of the sticks of gum are left in the package?" *Four sevenths*. Record the subtraction equation,  $\frac{7}{7} - \frac{3}{7} = \frac{4}{7}$ , on the chalkboard.

Devise other equations using sticks of gum or other familiar items. Point out the illustrations and the corresponding addition and subtraction equations at the top of page 324. Model  $\frac{2}{3} - \frac{1}{3} = \frac{1}{3}$  with a glass of water that is two thirds full. Draw illustrations on the chalkboard similar to those at the top of the page.

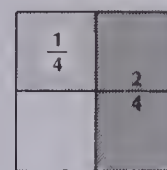
## Adding and Subtracting Fractions



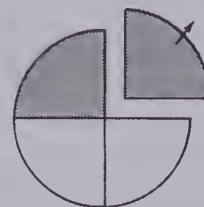
$$\frac{1}{3} + \frac{1}{3} = \frac{2}{3}$$



$$\frac{2}{3} - \frac{1}{3} = \frac{1}{3}$$



$$\frac{1}{4} + \frac{2}{4} = \frac{3}{4}$$



$$\frac{3}{4} - \frac{1}{4} = \frac{2}{4}$$

### EXERCISES

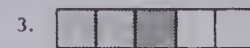
Add or subtract



$$\frac{1}{3} + \frac{1}{3} = \frac{2}{3}$$



$$\frac{1}{4} + \frac{1}{4} = \frac{2}{4}$$



$$\frac{2}{5} + \frac{1}{5} = \frac{3}{5}$$



$$\frac{3}{4} + \frac{1}{4} = \frac{4}{4}$$



$$\frac{2}{6} + \frac{1}{6} = \frac{3}{6}$$



$$\frac{3}{4} - \frac{1}{4} = \frac{2}{4}$$



$$\frac{2}{3} - \frac{1}{3} = \frac{1}{3}$$



$$\frac{3}{5} - \frac{2}{5} = \frac{1}{5}$$



$$\frac{5}{8} - \frac{3}{8} = \frac{2}{8}$$

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### Using the Exercises

- Questions 1 to 5 involve interpreting illustrations of the addition of fractions with like denominators. Help the students with questions like, "What fractional part is shaded grey? What fractional part is shaded blue? How much in all is shaded?"
- Questions 6 to 9 involve interpreting illustrations of the subtraction of fractions with like denominators. Questions like, "What fractional part of the whole is shaded? What part is taken away? What part is left?" should help the students get started.



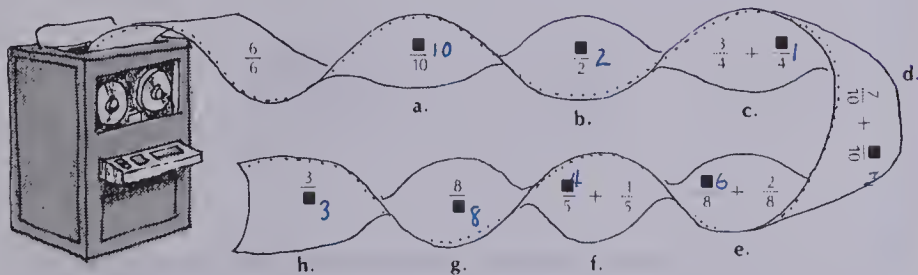
## PRACTICE

Add or subtract.

1.   
 $\frac{2}{3} - \frac{1}{3} = \frac{1}{3}$
2.   
 $\frac{1}{4} + \frac{1}{4} = \frac{2}{4}$
3.   
 $\frac{2}{5} + \frac{1}{5} = \frac{3}{5}$
4.   
 $\frac{5}{8} - \frac{1}{8} = \frac{4}{8}$
5.   
 $\frac{5}{7} - \frac{1}{7} = \frac{4}{7}$
6.   
 $\frac{3}{8} + \frac{3}{8} = \frac{6}{8}$
7.   
 $\frac{4}{5} - \frac{2}{5} = \frac{2}{5}$
8.   
 $\frac{2}{6} + \frac{2}{6} = \frac{4}{6}$
9.   
 $\frac{6}{9} - \frac{2}{9} = \frac{4}{9}$
10.  $\frac{4}{10} + \frac{3}{10} = \frac{7}{10}$
11.  $\frac{5}{10} - \frac{1}{10} = \frac{4}{10}$
12.  $\frac{5}{10} + \frac{4}{10} = \frac{9}{10}$
13.  $\frac{3}{5} + \frac{1}{5} = \frac{4}{5}$
14.  $\frac{4}{5} - \frac{2}{5} = \frac{2}{5}$
15.  $\frac{1}{5} + \frac{1}{5} = \frac{2}{5}$

## Looking Out for Number 1

Computers don't see fractions very often.  
Help the computer complete each name for 1.



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## Assigning the Practice

Minimum: 1-12

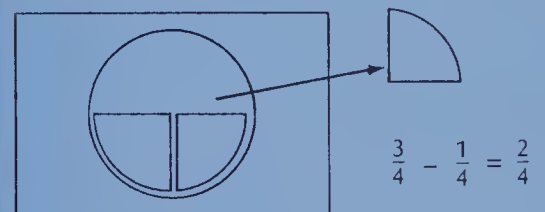
Average: 4-15

Enriched: 4-15


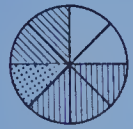
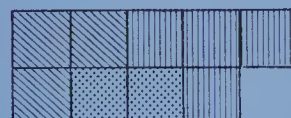
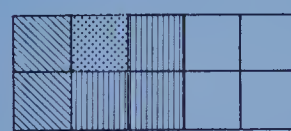
## Reinforcement

1. Assign *Looking Out for Number 1* at the bottom of page 325.

2. Give pairs of students felt, plastic, or paper fractional parts of whole circles. Ask one student to do an addition or subtraction action with the pieces and the other to write the corresponding equation. To reinforce the idea of one whole, have them place their pieces on a mat having the whole circle drawn on it.

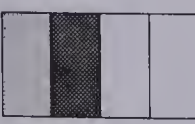




## Enrichment

1.   
 $\frac{1}{5} + \frac{1}{5} + \frac{2}{5} = \frac{4}{5}$
2.   
 $\frac{2}{8} + \frac{1}{8} + \frac{3}{8} = \frac{6}{8}$
3. 
4. 

## Extra Practice




Add.

1.   
 $\frac{1}{4} + \frac{1}{4} = \frac{2}{4}$
2.   
 $\frac{1}{3} + \frac{1}{3} = \frac{2}{3}$
3.   
 $\frac{2}{5} + \frac{2}{5} = \frac{4}{5}$

4. Draw a picture to show  $\frac{3}{8} + \frac{2}{8} = \frac{5}{8}$ .



Subtract.

5.   
 $\frac{3}{4} - \frac{1}{4} = \frac{2}{4}$
6.   
 $\frac{4}{6} - \frac{1}{6} = \frac{3}{6}$
7.   
 $\frac{4}{5} - \frac{2}{5} = \frac{2}{5}$

## Worksheet A68

Pages 324-325

# UNIT 14 LESSON 9

## Objective A69

Change fractions to decimals.

### Introducing the Lesson

So that the students will be more successful with this lesson, review naming equivalent fractions from illustrations (Unit 7, Lesson 2, pages 144-145) and writing tenths as fractions and as decimals (Unit 7, Lesson 5, pages 150-151).

Use examples similar to the following.

equivalent fractions



$$\frac{1}{3} = \frac{2}{6}$$

tenths



$$\frac{7}{10} \text{ or } 0.7$$

### Teaching the Lesson

Talk about how the representation of fractional parts today is more often done in decimals, rather than in fractions. Explain that a calculator uses decimals and that if one wishes to add two fractions, he or she must first change them to an equivalent decimal. For example, a calculator does not use

$\frac{1}{10} + \frac{1}{10}$ , yet it does use  $0.1 + 0.1$ . There-

fore, it is important to know decimal names for fractions.

Remind students that they have already learned the decimal names for fractions in tenths. Show the students how to use illustrations for changing halves and fifths to decimals.

1. Change to an equivalent fraction in tenths.

a.   $\frac{1}{2} = \frac{5}{10}$

b.   $\frac{4}{5} = \frac{8}{10}$

2. Change the fraction in tenths to an equivalent decimal.

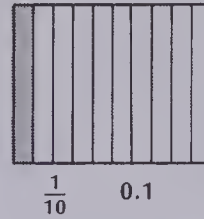
a.  $\frac{5}{10} = 0.5$

b.  $\frac{8}{10} = 0.8$

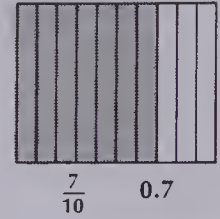
So,  $\frac{1}{2} = 0.5$

So,  $\frac{4}{5} = 0.8$

## Decimal Names for Fractions



$$\frac{1}{10} = 0.1$$

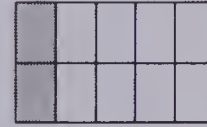


$$\frac{7}{10} = 0.7$$



$$\frac{1}{2} = \frac{5}{10}$$

$$\frac{1}{2} = 0.5$$



$$\frac{1}{5} = \frac{2}{10}$$

$$\frac{1}{5} = 0.2$$

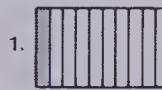


$$\frac{2}{5} = \frac{4}{10}$$

$$\frac{2}{5} = 0.4$$

### EXERCISES

Write the fraction in words.



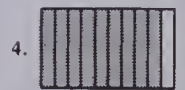
1 tenth



3 tenths

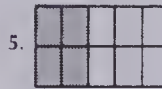


7 tenths

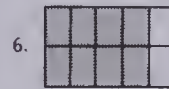


9 tenths

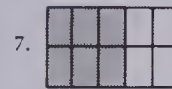
Use the picture to complete the sentence.



$$2 \frac{\square}{5} = \frac{\square}{10}$$



$$4 \frac{\square}{5} = \frac{\square}{10}$$

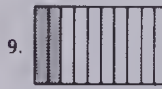


$$3 \frac{\square}{5} = \frac{\square}{10}$$



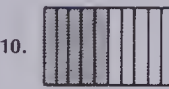
$$1 \frac{\square}{2} = \frac{\square}{10}$$

Write the decimal.



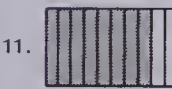
$$\frac{2}{10} = 0.\square$$

0.2



$$\frac{5}{10} = 0.\square$$

0.5



$$\frac{8}{10} = \square.\square$$

0.8



$$\frac{4}{10} = \square.\square$$

0.4

13.  $\frac{7}{10} = \square.\square$

0.7

14.  $\frac{3}{10} = \square.\square$

0.3

15.  $\frac{1}{10} = \square.\square$

0.1

16.  $\frac{9}{10} = \square.\square$

0.9

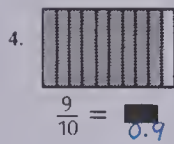
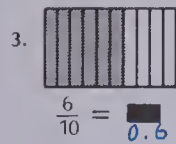
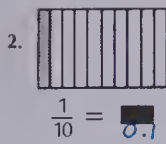
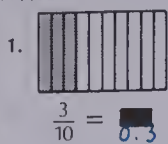
326

### Using the Exercises

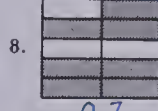
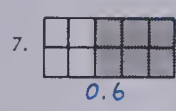
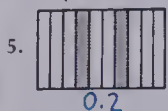
- Questions 1 to 4 require the students to recognize a number of tenths.
- Questions 5 to 8 involve naming equivalent fractions in tenths by looking at illustrations.
- Questions 9 to 16 require the students to name equivalent decimals in tenths.

## PRACTICE

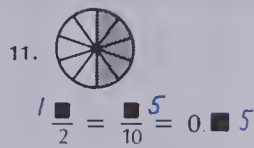
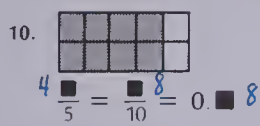
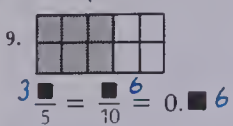
Write the decimal.



What part is shaded? Write the decimal.



Use the picture to complete the sentence



Write the decimal.

12.  $\frac{7}{10} \underline{0.7}$

13.  $\frac{5}{10} \underline{0.5}$

14.  $\frac{1}{2} \underline{0.5}$

15.  $\frac{8}{10} \underline{0.8}$

16.  $\frac{1}{5} \underline{0.2}$

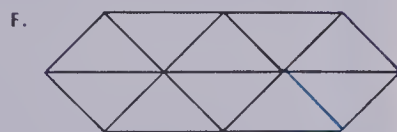
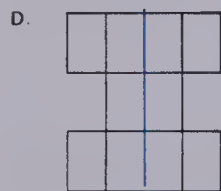
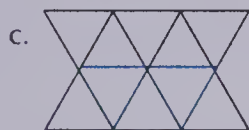
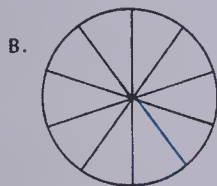
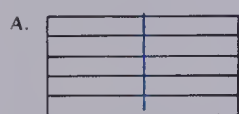
17.  $\frac{2}{5} \underline{0.4}$

18.  $\frac{4}{5} \underline{0.8}$

19.  $\frac{3}{5} \underline{0.6}$

## Drawing Your Attention

Trace these figures. Help the machine draw a straight line segment that cuts the figure into 10 equal parts.



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## Assigning the Practice

Minimum: 1-11

Average: 5-15

Enriched: 9-19

## Reinforcement

1. Write sets of equivalents, e.g.,  $\frac{2}{10}$ , 0.2,

and two tenths, on a deck of blank cards. Have the students play *Fish* with the cards. Players must have all three equivalents in the set before they lay it down.

2. Give the students graph paper. Ask them to make rectangles illustrating these equalities.

a.  $\frac{7}{10} = 0.7$

b.  $\frac{1}{10} = 0.1$

c.  $\frac{2}{5} = \frac{4}{10} = 0.4$

d.  $\frac{1}{2} = \frac{5}{10} = 0.5$

e.  $\frac{4}{5} = \frac{8}{10} = 0.8$

f.  $\frac{1}{5} = \frac{2}{10} = 0.2$

## Enrichment

1. Assign *Drawing Your Attention* at the bottom of page 327.

2. Have the students use  $<$ ,  $=$ , or  $>$  to complete the following.

a.  $\frac{4}{5} \bigcirc 0.6$

b.  $\frac{9}{10} \bigcirc 0.8$

c.  $0.2 \bigcirc \frac{1}{5}$

d.  $0.4 \bigcirc \frac{1}{2}$

3. Ask the students to change the addends to decimals and then add the following with a calculator.

a.  $\frac{1}{5} + \frac{2}{5}$

b.  $\frac{3}{10} + \frac{1}{2}$

c.  $\frac{4}{10} + \frac{1}{5}$

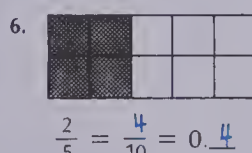
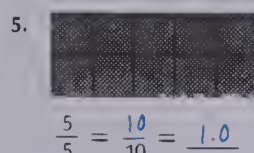
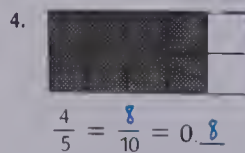
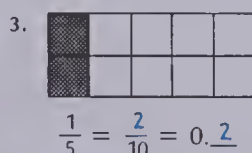
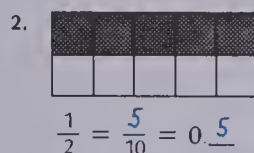
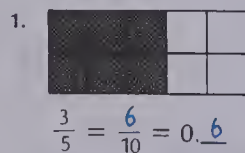
d.  $\frac{1}{10} + \frac{2}{5}$

## Extra Practice

## Worksheet A69

Pages 326-327

Complete.





Unit 14 Objectives	Test Questions	Pages
N14	1-6	310-311
N15	7-12	312-313
N16	29-30	314-315
A66	13-16	316-317
A67	17-20	318-319
M21	31-32	322-323
A68	21-28	324-325
A69	33-37	326-327
PS15	38	

TEST

UNIT 14

Write as a decimal.

1. 39 hundredths  $0.39$

2. 3 hundredths  $0.03$

3. 73 hundredths  $0.73$

4.  $\frac{4}{100}$   $0.04$

5.  $\frac{87}{100}$   $0.87$

6.  $\frac{34}{100}$   $0.34$

Compare the decimals. Use  $<$ ,  $>$ , or  $=$  for  $\blacksquare$ .

7. 14.53  $\blacksquare$  14.35

8. 0.1  $\blacksquare$  1.0

9. 289.39  $\blacksquare$  289.93

10. 64.5  $\blacksquare$  64.50

11. 12.09  $\blacksquare$  12.10

12. 0.12  $\blacksquare$  0.08

Add or subtract.

13. 
$$\begin{array}{r} 4.27 \\ + 8.19 \\ \hline 12.46 \end{array}$$

14. 
$$\begin{array}{r} 39.08 \\ + 6.54 \\ \hline 45.62 \end{array}$$

15. 
$$\begin{array}{r} 264.71 \\ + 51.38 \\ \hline 316.09 \end{array}$$

16. 
$$\begin{array}{r} \$35.97 \\ + 25.03 \\ \hline \$61.00 \end{array}$$

17. 
$$\begin{array}{r} 5.92 \\ - 3.98 \\ \hline 1.94 \end{array}$$

18. 
$$\begin{array}{r} 64.15 \\ - 7.36 \\ \hline 56.79 \end{array}$$

19. 
$$\begin{array}{r} 803.09 \\ - 46.10 \\ \hline 756.99 \end{array}$$

20. 
$$\begin{array}{r} \$162.88 \\ - 83.49 \\ \hline \$79.39 \end{array}$$

21.  $\frac{1}{2} + \frac{1}{2} = 1$

22.  $\frac{1}{5} + \frac{3}{5} = \frac{4}{5}$

23.  $\frac{3}{4} - \frac{1}{4} = \frac{2}{4}$

24.  $\frac{5}{8} - \frac{4}{8} = \frac{1}{8}$

25.  $\frac{1}{6} + \frac{1}{6} = \frac{2}{6}$

26.  $\frac{4}{5} - \frac{1}{5} = \frac{3}{5}$

27.  $\frac{6}{10} - \frac{3}{10} = \frac{3}{10}$

28.  $\frac{2}{8} + \frac{3}{8} = \frac{5}{8}$

Regroup.

29. 6 tenths + 2 hundredths = 5 tenths +  $\overset{12}{\blacksquare}$  hundredths

30. 8 ones +  $\frac{1}{10}$  tenth =  $\blacksquare$  ones +  $\blacksquare$  tenths

31. 32 mm =  $\blacksquare$  cm and  $\frac{1}{10}$  mm =  $\blacksquare$  cm  $3.2$

32. 113 cm =  $\blacksquare$  m and  $\blacksquare$  cm =  $\blacksquare$  m  $1.13$

Write as a decimal.

33.  $\frac{3}{10}$   $0.3$

34.  $\frac{1}{2}$   $0.5$

35.  $\frac{4}{5}$   $0.8$

36.  $\frac{7}{10}$   $0.7$

37.  $\frac{1}{5}$   $0.2$

38. A radio mast in Poland is 646.36 m tall. A television mast in North Dakota is 628.80 m tall. How much taller is the radio mast?  $17.56\text{ m}$

Post-test

Unit 14

Write the decimal.

1. 12 hundredths  $0.12$

2. 1 hundredth  $0.01$

3. 65 hundredths  $0.65$

4.  $\frac{7}{100}$   $0.07$

5.  $\frac{29}{100}$   $0.29$

6.  $\frac{81}{100}$   $0.81$

Compare the decimals. Use  $<$ ,  $=$ , or  $>$ .

7. 37.25  $<$  37.52

8. 0.2  $<$  2.0

9. 1  $>$  0.9

10. 8.17  $=$  8.17

11. 114.29  $>$  113.30

12. 0.45  $<$  0.50

Add or subtract.

13. 
$$\begin{array}{r} 3.58 \\ + 6.95 \\ \hline 10.53 \end{array}$$

14. 
$$\begin{array}{r} 33.62 \\ + 9.89 \\ \hline 43.51 \end{array}$$

15. 
$$\begin{array}{r} 471.97 \\ + 9.82 \\ \hline 481.79 \end{array}$$

16. 
$$\begin{array}{r} \$24.16 \\ + 19.95 \\ \hline \$44.11 \end{array}$$

17. 
$$\begin{array}{r} 8.56 \\ - 3.57 \\ \hline 4.99 \end{array}$$

18. 
$$\begin{array}{r} 24.08 \\ - 9.59 \\ \hline 14.49 \end{array}$$

19. 
$$\begin{array}{r} 600.32 \\ - 4.48 \\ \hline 595.84 \end{array}$$

20. 
$$\begin{array}{r} \$70.00 \\ - 13.26 \\ \hline \$56.74 \end{array}$$

## GRAPHS

- How many girls are in grades 1 to 6? **8637**
- Which grades have the least number of boys? **7-9**
- Are there more boys or more girls in grades 10 to 12? **girls**

School Enrolment

	Girls	Boys
Grades 1 to 6	8637	8803
Grades 7 to 9	4208	4215
Grades 10 to 12	5136	4792

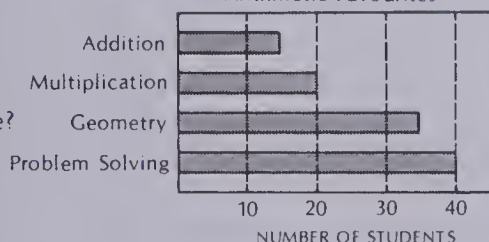
Students in Fairville Schools

Central	XXXX
Eastern	XXXX
Western	XXXX
Southern	XX

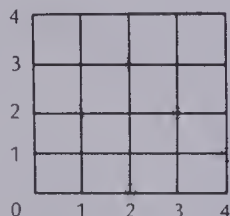
X represents 100 students.

- How many students does each picture represent? **100**
- How many students attend Central School? **400**
- How many students attend the 4 schools in Fairville? **1200**

Arithmetic Favourites



- Which topic was chosen by 20 students? **Multiplication**
- How many students chose Geometry as their favourite? **35**
- Make a point graph to show the number of days in February, March, April, and May of this year. **Answers vary - depends on year.**



- What ordered pair gives the location of A? **(1, 2)**
- What letter is at (2, 3)? **E**
- Slide D right 1, up 3. What is its new location? **(3, 3)**

329

- $\frac{1}{3} + \frac{1}{3} = \frac{2}{3}$
- $\frac{1}{10} + \frac{3}{10} = \frac{4}{10}$
- $\frac{5}{5} - \frac{3}{5} = \frac{2}{5}$
- $\frac{2}{2} - \frac{1}{2} = \frac{1}{2}$
- $\frac{5}{7} + \frac{2}{7} = \frac{7}{7}$
- $\frac{3}{4} - \frac{1}{4} = \frac{2}{4}$
- $\frac{9}{10} - \frac{6}{10} = \frac{3}{10}$
- $\frac{1}{8} + \frac{5}{8} = \frac{6}{8}$

Regroup.

- 9 tenths + 2 hundredths = 8 tenths + **12** hundredths
- 7 ones + 5 tenths = **6** ones + 15 tenths
- 63 mm = **6** cm + **3** mm = **6.3** cm
- 192 cm = **1** m + **92** cm = **1.92** m

Write the decimal.

- $\frac{4}{10} = \mathbf{0.4}$
- $\frac{1}{5} = \mathbf{0.2}$
- $\frac{3}{5} = \mathbf{0.6}$
- $\frac{1}{2} = \mathbf{0.5}$
- $\frac{9}{10} = \mathbf{0.9}$

Solve.

- A pine tree is 4.5 m tall. A blue spruce tree is 3.9 m tall. What is the difference in their heights? **0.6 m**

# Cumulative Test

## UNITS 1-4

Copy and complete. Use  $<$ ,  $=$ , or  $>$  for  $\blacksquare$ .

1.  $23 \blacksquare 32$   $<$
2.  $91 \blacksquare 91$   $=$
3.  $\$0.51 \blacksquare \$0.49$   $>$
4.  $926 \blacksquare 962$   $<$
5.  $710 \blacksquare 701$   $>$
6.  $2873 \blacksquare 2900$   $<$

Write in standard form.

7. 8 hundreds + 2 tens + 3 ones **823**
8. 5 hundreds + 0 tens + 6 ones **506**
9. twenty-nine thousand three **29003**
10. six hundred thousand six hundred **600 600**

Write in expanded form.

11. 62 803
12. 1459
13. 708 043

Round to the nearest ten. Round to the nearest hundred.

14. 956 **960**  
**1000**
15. 82 615 **82 620**  
**82 600**
16. 3074 **3070**  
**3100**

Add or subtract.

17.  $\begin{array}{r} 6 \\ + 7 \\ \hline \end{array}$  **13**
18.  $\begin{array}{r} 8 \\ + 5 \\ \hline \end{array}$  **13**
19.  $\begin{array}{r} 13 \\ - 6 \\ \hline \end{array}$  **7**
20.  $3 + 9$  **12**
21.  $15 - 7$  **8**
22.  $\begin{array}{r} 35 \\ + 40 \\ \hline \end{array}$  **75**
23.  $\begin{array}{r} 87 \\ - 53 \\ \hline \end{array}$  **34**
24.  $\begin{array}{r} 46 \\ + 7 \\ \hline \end{array}$  **53**
25.  $\begin{array}{r} 89 \\ + 4 \\ \hline \end{array}$  **93**
26.  $\begin{array}{r} 53 \\ - 2 \\ \hline \end{array}$  **51**
27.  $\begin{array}{r} 2 \\ + 6 \\ \hline \end{array}$  **8**
28.  $\begin{array}{r} 5 \\ + 3 \\ \hline \end{array}$  **8**
29.  $\begin{array}{r} 18 \\ + 7 \\ \hline \end{array}$  **25**
30.  $\begin{array}{r} 436 \\ + 261 \\ \hline \end{array}$  **697**
31.  $\begin{array}{r} 827 \\ - 305 \\ \hline \end{array}$  **522**
32.  $\begin{array}{r} 1 \\ + 29 \\ \hline \end{array}$  **30**
33.  $\begin{array}{r} 9 \\ + 15 \\ \hline \end{array}$  **24**

Solve.

32. There were 3 blue marbles, 5 green marbles, and 7 red marbles in a bag. How many marbles were in the bag? **15**

Add or subtract.

33.  $\begin{array}{r} 35 \\ + 49 \\ \hline \end{array}$  **84**
34.  $\begin{array}{r} 67 \\ + 13 \\ \hline \end{array}$  **80**
35.  $\begin{array}{r} 51 \\ - 34 \\ \hline \end{array}$  **17**
36.  $\begin{array}{r} 80 \\ - 52 \\ \hline \end{array}$  **28**
37.  $\begin{array}{r} 46 \\ + 286 \\ \hline \end{array}$  **332**
38.  $\begin{array}{r} 167 \\ + 453 \\ \hline \end{array}$  **620**
39.  $\begin{array}{r} 6514 \\ + 896 \\ \hline \end{array}$  **7410**
40.  $\begin{array}{r} 326 \\ - 189 \\ \hline \end{array}$  **137**
41.  $\begin{array}{r} 8026 \\ + 1694 \\ \hline \end{array}$  **9720**
42.  $\begin{array}{r} 3784 \\ - 1096 \\ \hline \end{array}$  **2688**
43.  $\begin{array}{r} 138 \\ 275 \\ + 354 \\ \hline \end{array}$  **767**
44.  $\begin{array}{r} 6000 \\ - 2194 \\ \hline \end{array}$  **3806**
45.  $\begin{array}{r} 2195 \\ 384 \\ + 3670 \\ \hline \end{array}$  **6249**
46.  $\begin{array}{r} 9720 \\ - 356 \\ \hline \end{array}$  **9364**
47.  $\begin{array}{r} 8.34 \\ - 6.35 \\ \hline \end{array}$  **1.99**

What is the missing number?

48.  $1 \text{ km} = \blacksquare \text{ m}$  **1000**
49.  $10 \text{ mm} = \blacksquare \text{ cm}$  **1**
50.  $\blacksquare \text{ L} = 1000 \text{ mL}$  **1**

Find the width of each letter.

51.  **1 cm**
52.  **15 mm**
53.  **8 mm**

Find the perimeter.

54.  **20 m**
55.  **36 cm**

What is the change:

56. for  $\$0.56$  from  $\$1.00$ ? **44¢**
57. for  $\$3.64$  from  $\$5.00$ ? **\\$1.36**

Solve.

58. A city sold 3000 bicycle licences. 1327 of the bicycles were owned by girls. How many bicycles were owned by boys? **1673**
59. A concert was attended by 2106 people in the afternoon and 3025 in the evening. How many people attended that day? **5131**



# Cumulative Test

## UNITS 5-7

Write a multiplication sentence.

1.  $7 + 7 + 7 + 7 = 28$       2.  $3 + 3 + 3 + 3 + 3 + 3 = 18$

$7 \times 4 = 28$

$6 \times 3 = 18$

Write an addition sentence.

3.  $3 \times 8 = 24$       4.  $2 \times 0 = 0$       5.  $5 \times 9 = 45$

$8 + 8 + 8 = 24$

$0 + 0 = 0$

$9 + 9 + 9 + 9 = 45$

Multiply.

6.  $\begin{array}{r} 8 \\ \times 4 \\ \hline 32 \end{array}$       7.  $\begin{array}{r} 1 \\ \times 9 \\ \hline 9 \end{array}$       8.  $\begin{array}{r} 3 \\ \times 0 \\ \hline 0 \end{array}$       9.  $\begin{array}{r} 10 \\ \times 2 \\ \hline 20 \end{array}$       10.  $\begin{array}{r} 7 \\ \times 8 \\ \hline 56 \end{array}$

11.  $\begin{array}{r} 6 \\ \times 9 \\ \hline 54 \end{array}$       12.  $\begin{array}{r} 5 \\ \times 7 \\ \hline 35 \end{array}$       13.  $\begin{array}{r} 4 \\ \times 9 \\ \hline 36 \end{array}$       14.  $\begin{array}{r} 1 \\ \times 1 \\ \hline 1 \end{array}$       15.  $\begin{array}{r} 0 \\ \times 8 \\ \hline 0 \end{array}$

Write a division sentence.

16.  $5 \times 6 = 30$       17.  $9 \times 9 = 81$       18.  $4 \times 0 = 0$       19.  $10 \times 7 = 70$

$30 \div 5 = 6$

$81 \div 9 = 9$

$0 \div 4 = 0$

$70 \div 10 = 7$

Write a multiplication sentence

20.  $64 \div 8 = 8$       21.  $70 \div 10 = 7$       22.  $3 \div 1 = 3$       23.  $35 \div 5 = 7$

$8 \times 8 = 64$

$7 \times 10 = 70$

$3 \times 1 = 3$

$5 \times 7 = 35$

Divide.

24.  $\begin{array}{r} 9 \\ 2 \overline{)18} \end{array}$       25.  $\begin{array}{r} 3 \\ 5 \overline{)15} \end{array}$       26.  $\begin{array}{r} 8 \\ 1 \overline{)8} \end{array}$       27.  $\begin{array}{r} 8 \\ 7 \overline{)56} \end{array}$       28.  $\begin{array}{r} 6 \\ 8 \overline{)48} \end{array}$

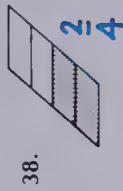
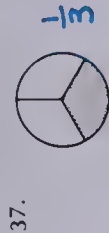
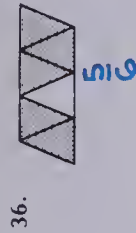
29.  $\begin{array}{r} 9 \\ 6 \overline{)54} \end{array}$       30.  $\begin{array}{r} 1 \\ 4 \overline{)4} \end{array}$       31.  $\begin{array}{r} 10 \\ 10 \overline{)100} \end{array}$       32.  $\begin{array}{r} 3 \\ 21 \overline{)7} \end{array}$       33.  $\begin{array}{r} 0 \\ 0 \overline{)0} \end{array}$

Solve.

34. An arithmetic test had 5 rows of questions. Each row had 5 questions in it. How many questions were on the test?

35. Frank's paper route covers 8 blocks. He delivers 72 papers. Each block has the same number of customers. How many papers does he deliver in each block? **9**

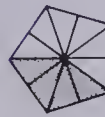
Write a fraction for the shaded part.



Copy and complete.



$\frac{1}{2} = \frac{\blacksquare}{4}$       **2**



$\frac{2}{5} = \frac{\blacksquare}{10}$       **4**



$\frac{2}{3} = \frac{\blacksquare}{6}$       **4**

Copy and write < or > in place of  $\blacksquare$ .

43.  $\frac{3}{10} \blacksquare \frac{1}{10}$       **>**

44.  $\frac{4}{5} \blacksquare \frac{5}{5}$       **<**

45.  $\frac{1}{5} \blacksquare \frac{2}{5}$       **<**

46.  $\frac{7}{8} \blacksquare \frac{1}{8}$       **>**

Write as a decimal.

47.  $\frac{6}{10}$       **0.6**

48.  $\frac{19}{10}$       **1.9**

49.  $\frac{10}{10}$       **1.0**

50.  $\frac{34}{10}$       **3.4**

Copy and complete.

51.  $40 \text{ cm} = \blacksquare \text{ dm}$       **4**

52.  $7 \text{ dm} = \blacksquare \text{ m}$       **0.7**

Add or subtract.

53.  $\begin{array}{r} 3.1 \\ + 5.6 \\ \hline 8.7 \end{array}$

54.  $\begin{array}{r} 7.8 \\ - 2.5 \\ \hline 5.3 \end{array}$

55.  $\begin{array}{r} 37.4 \\ - 11.8 \\ \hline 49.2 \end{array}$

56.  $\begin{array}{r} 43.3 \\ - 12.5 \\ \hline 30.8 \end{array}$

57.  $\begin{array}{r} 437.5 \\ + 29.6 \\ \hline 467.1 \end{array}$

58.  $\begin{array}{r} 858.1 \\ - 69.4 \\ \hline 788.7 \end{array}$

59.  $\begin{array}{r} 460.0 \\ - 181.2 \\ \hline 278.8 \end{array}$

60.  $\begin{array}{r} 3097.8 \\ + 1456.2 \\ \hline 4554.0 \end{array}$

# Cumulative Test

## UNITS 8-10

Compute.

1.  $7 \times (4 + 5)$  **63**      2.  $5 \times (5 + 5)$  **50**      3.  $2 \times (20 + 9)$  **58**

Multiply.

4.  $\begin{array}{r} 24 \\ \times 6 \\ \hline 144 \end{array}$       5.  $\begin{array}{r} 40 \\ \times 3 \\ \hline 120 \end{array}$       6.  $\begin{array}{r} 67 \\ \times 2 \\ \hline 134 \end{array}$       7.  $\begin{array}{r} 84 \\ \times 5 \\ \hline 420 \end{array}$

8.  $\begin{array}{r} 51 \\ \times 9 \\ \hline 459 \end{array}$       9.  $\begin{array}{r} 26 \\ \times 8 \\ \hline 208 \end{array}$       10.  $\begin{array}{r} 32 \\ \times 6 \\ \hline 192 \end{array}$       11.  $\begin{array}{r} 85 \\ \times 8 \\ \hline 680 \end{array}$

12.  $\begin{array}{r} 124 \\ \times 2 \\ \hline 248 \end{array}$       13.  $\begin{array}{r} 351 \\ \times 8 \\ \hline 2808 \end{array}$       14.  $\begin{array}{r} 406 \\ \times 9 \\ \hline 3654 \end{array}$       15.  $\begin{array}{r} 518 \\ \times 4 \\ \hline 2072 \end{array}$

16.  $\begin{array}{r} 300 \\ \times 5 \\ \hline 1500 \end{array}$       17.  $\begin{array}{r} 256 \\ \times 3 \\ \hline 768 \end{array}$       18.  $\begin{array}{r} 527 \\ \times 6 \\ \hline 3162 \end{array}$       19.  $\begin{array}{r} 814 \\ \times 7 \\ \hline 5698 \end{array}$

20.  $2 \times 9 \times 5$  **90**      21.  $10 \times 4 \times 6$  **240**      22.  $8 \times 3 \times 7$  **168**

Divide.

23.  $7 \overline{)35}$  **5**      24.  $4 \overline{)32}$  **8**      25.  $6 \overline{)38}$  **6 R2**      26.  $3 \overline{)29}$  **9 R2**

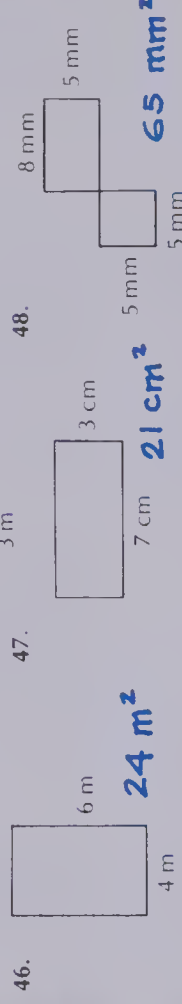
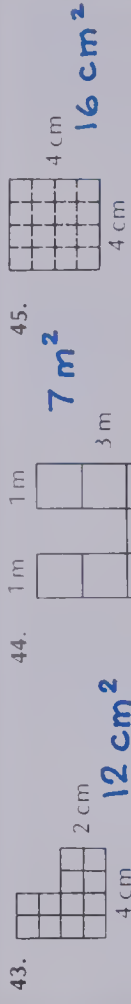
27.  $9 \overline{)39}$  **4 R3**      28.  $5 \overline{)50}$  **10**      29.  $6 \overline{)480}$  **80**      30.  $9 \overline{)540}$  **60**

31.  $4 \overline{)84}$  **21**      32.  $3 \overline{)39}$  **13**      33.  $6 \overline{)66}$  **11**      34.  $2 \overline{)36}$  **18**

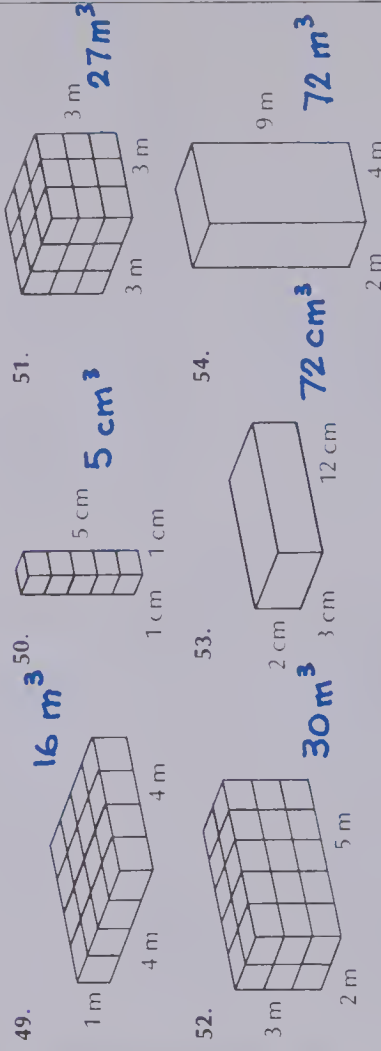
35.  $5 \overline{)70}$  **14**      36.  $3 \overline{)219}$  **73**      37.  $7 \overline{)637}$  **91**      38.  $5 \overline{)425}$  **85**

39.  $4 \overline{)348}$  **87**      40.  $7 \overline{)455}$  **65**      41.  $4 \overline{)107}$  **26 R3**      42.  $8 \overline{)607}$  **75 R7**

Find the area.



Find the volume.



Find the average

49. **64 m³**      50. **27 m³**

Copy and complete the table

3	6	9	12
5¢	10¢	15¢	20¢
		18	30¢

What time is it on the 24 hour clock?

51. **27 m³**      52. **8 m³**

53. **27 m³**      54. **64 m³**

55. 29, 16, 42, 25      56. 10, 15, 13, 8, 11, 9      57. **27 m³**

58. 9:15 A.M.      59. 2:00 P.M.      60. noon      61. 6:30 P.M.

09:15      14:00      12:00      18:30

# Cumulative Test

## UNITS 11-14

Multiply.

1.  $16 \times 50 = \underline{800}$
2.  $51 \times 20 = \underline{1020}$
3.  $32 \times 67 = \underline{2144}$
4.  $96 \times 13 = \underline{1248}$
5.  $27 \times 35 = \underline{945}$
6.  $481 \times 70 = \underline{33670}$
7.  $642 \times 40 = \underline{25680}$
8.  $176 \times 34 = \underline{5984}$
9.  $936 \times 71 = \underline{66456}$
10.  $752 \times 68 = \underline{51136}$
- Divide.  $243$
11.  $2 \overline{)486} = \underline{243}$
12.  $5 \overline{)550} = \underline{110}$
13.  $3 \overline{)936} = \underline{312}$
14.  $6 \overline{)672} = \underline{112}$
15.  $3 \overline{)651} = \underline{217}$
16.  $4 \overline{)472} = \underline{118}$
17.  $6 \overline{)726} = \underline{121}$
18.  $2 \overline{)354} = \underline{177}$
19.  $4 \overline{)536} = \underline{134}$
20.  $5 \overline{)617} = \underline{123R2}$
21.  $7 \overline{)849} = \underline{121R2}$
22.  $8 \overline{)915} = \underline{114R3}$
23.  $8 \overline{)852} = \underline{106R4}$
24.  $4 \overline{)824} = \underline{206}$
25.  $6 \overline{)615} = \underline{102R3}$

Match the name of the solid.



sphere



prism



cube

- A. cube  
B. sphere  
C. prism  
D. pyramid

Are the figures congruent?



Yes



no

Match the name of the figure



D.



B.



C.



Yes

- A. square  
B. rectangle  
C. hexagon  
D. pentagon

Choose the correct answer below.

35.  $S \div 2$

flip  
not a flip

36.

flip  
slide

37.



$\frac{1}{4}$  turn  
 $\frac{1}{2}$  turn

Library Books Read

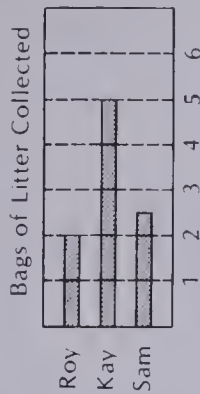
Jerry	
Janine	
Jason	

Each represents 2 books

38. How many books did

Janine read? **5**

39. How many books did all three children read? **17**



40. Who collected the most litter?

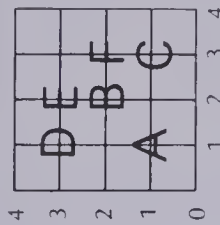
**Kay**

41. How many bags of litter did Roy collect? **2**

42. What letter is at (1,1)? **A**

43. What letter is at (3,2)? **F**

44. Slide A right 2, up 1. Where will it be? **(3,2)**



Write as a decimal.

45.  $\frac{36}{100} = \underline{0.36}$

46. eighty-eight hundredths **0.88**

47.  $\frac{1}{100} = \underline{0.01}$

48. ten and seven hundredths **10.07**

Add or subtract.

49.  $3.67 + 4.76 = \underline{8.43}$

50.  $6.09 - 4.52 = \underline{1.57}$

51.  $45.68 + 50.79 = \underline{96.47}$

52.  $63.24 + 47.96 = \underline{111.20}$

53.  $24.26 + 4.98 = \underline{49.24}$

54.  $50.00 - 9.34 = \underline{40.66}$

55.  $312.78 + 403.65 = \underline{716.43}$

56.  $600.21 - 355.47 = \underline{244.74}$

57.  $\frac{1}{4} + \frac{2}{4} = \underline{\frac{3}{4}}$

58.  $\frac{4}{5} - \frac{1}{5} = \underline{\frac{3}{5}}$

59.  $\frac{3}{8} + \frac{2}{8} = \underline{\frac{5}{8}}$

60.  $\frac{3}{10} - \frac{2}{10} = \underline{\frac{1}{10}}$



Addition					
1. 8 +0 <u>8</u>	2. 9 +4 <u>13</u>	3. 6 +7 <u>13</u>	4. 3 +5 <u>8</u>	5. 8 +9 <u>17</u>	
6. 9 + 7 <u>16</u>	7. 3 + 8 <u>11</u>	8. 4 + 5 <u>9</u>	9. 6 + 8 <u>14</u>	10. 7 + 9 <u>16</u>	
11. 30 + 2 <u>32</u>	12. 74 + 6 <u>80</u>	13. 58 + 7 <u>65</u>	14. 56 + 5 <u>61</u>	15. 9 + 36 <u>45</u>	
16. 36 + 51 <u>87</u>	17. 46 + 27 <u>73</u>	18. 62 + 24 <u>86</u>	19. 58 + 33 <u>91</u>	20. 74 + 36 <u>110</u>	
21. 4 2 + 7 <u>13</u>	22. 8 3 + 2 <u>13</u>	23. 24 14 + 41 <u>79</u>	24. 16 53 + 22 <u>91</u>	25. 356 213 + 194 <u>763</u>	
26. 416 + 5 <u>421</u>	27. 607 + 8 <u>615</u>	28. 86 + 254 <u>340</u>	29. 846 + 57 <u>903</u>	30. 65 + 238 <u>303</u>	
31. 407 + 305 <u>712</u>	32. 174 + 237 <u>411</u>	33. 335 + 176 <u>511</u>	34. 218 + 362 <u>580</u>	35. 699 + 105 <u>804</u>	
36. 3857 + 153 <u>4010</u>	37. 643 + 1228 <u>1871</u>	38. 574 + 3268 <u>3842</u>	39. 4369 + 138 <u>4507</u>	40. 507 + 4197 <u>4704</u>	
41. 3594 + 5609 <u>9203</u>	42. 2788 + 2585 <u>5373</u>	43. 6487 + 1036 <u>7523</u>	44. 3296 + 5917 <u>9213</u>	45. 3897 + 5984 <u>9881</u>	
46. 0.4 + 0.3 <u>0.7</u>	47. 0.8 + 0.5 <u>1.3</u>	48. 6.9 + 4.7 <u>11.6</u>	49. 14.3 + 8.9 <u>23.2</u>	50. 97.32 + 187.67 <u>284.99</u>	
51. 0.9 + 0.7 <u>1.6</u>	52. 41.8 + 2.7 <u>44.5</u>	53. 189.4 + 8.5 <u>197.9</u>			

Subtraction					
1. 18 - 9 <u>9</u>	2. 14 - 6 <u>8</u>	3. 12 - 7 <u>5</u>	4. 11 - 5 <u>6</u>	5. 16 - 8 <u>8</u>	
6. 14 - 9 <u>5</u>	7. 3 - 0 <u>3</u>	8. 8 - 4 <u>4</u>	9. 11 - 7 <u>4</u>	10. 15 - 8 <u>7</u>	
11. 85 - 5 <u>80</u>	12. 25 - 6 <u>19</u>	13. 56 - 8 <u>48</u>	14. 30 - 9 <u>21</u>	15. 43 - 6 <u>37</u>	
16. 74 - 56 <u>18</u>	17. 81 - 53 <u>28</u>	18. 62 - 15 <u>47</u>	19. 45 - 27 <u>18</u>	20. 93 - 48 <u>45</u>	
21. 419 - 72 <u>347</u>	22. 364 - 57 <u>307</u>	23. 609 - 40 <u>569</u>	24. 170 - 80 <u>90</u>	25. 579 - 93 <u>486</u>	
26. 571 - 93 <u>478</u>	27. 451 - 86 <u>365</u>	28. 425 - 73 <u>352</u>	29. 312 - 74 <u>238</u>	30. 283 - 91 <u>192</u>	
31. 835 - 486 <u>349</u>	32. 411 - 223 <u>188</u>	33. 640 - 596 <u>44</u>	34. 454 - 379 <u>75</u>	35. 800 - 241 <u>559</u>	
36. 5315 - 428 <u>4887</u>	37. 3614 - 526 <u>3088</u>	38. 8162 - 695 <u>7467</u>	39. 4112 - 359 <u>3753</u>	40. 3000 - 259 <u>2741</u>	
41. 3465 - 2877 <u>588</u>	42. 3240 - 2951 <u>289</u>	43. 8642 - 3865 <u>4777</u>	44. 7420 - 4159 <u>3261</u>	45. 8000 - 5362 <u>2638</u>	
46. 0.7 - 0.2 <u>0.5</u>	47. 5.8 - 3.2 <u>2.6</u>	48. 9.1 - 6.2 <u>2.9</u>	49. 47.3 - 8.6 <u>38.7</u>	50. 931.6 - 42.7 <u>888.9</u>	

Multiplication

Multiply.

1.  $9 \times 6$

54

2.  $8 \times 7$

56

3.  $4 \times 0$

0

4.  $5 \times 9$

45

5.  $10 \times 3$

30

6.  $6 \times 1$

6

7.  $8 \times 6$

48

8.  $9 \times 7$

63

9.  $3 \times 0$

0

10.  $10 \times 1$

10

11.  $60 \times 9$

540

12.  $90 \times 5$

450

13.  $70 \times 8$

560

14.  $30 \times 6$

180

15.  $50 \times 5$

250

16.  $43 \times 2$

86

17.  $21 \times 4$

84

18.  $81 \times 5$

405

19.  $71 \times 6$

426

20.  $53 \times 3$

159

21.  $36 \times 8$

288

22.  $95 \times 6$

570

23.  $72 \times 5$

360

24.  $94 \times 3$

282

25.  $58 \times 7$

406

26.  $300 \times 7$

2100

27.  $600 \times 5$

3000

28.  $800 \times 9$

7200

29.  $406 \times 4$

1624

30.  $715 \times 7$

5005

31.  $629 \times 7$

4403

32.  $381 \times 9$

3429

33.  $654 \times 8$

5232

34.  $955 \times 2$

1910

35.  $874 \times 4$

3496

36.  $2 \times 4 \times 5$

40

37.  $9 \times 7 \times 0$

0

38.  $8 \times 6 \times 1$

48

39.  $37 \times 20$

740

40.  $95 \times 10$

950

41.  $53 \times 70$

3710

42.  $63 \times 21$

1323

43.  $84 \times 35$

2940

44.  $45 \times 92$

4140

45.  $16 \times 37$

592

46.  $345 \times 30$

10350

47.  $579 \times 20$

11580

48.  $906 \times 50$

45300

49.  $820 \times 90$

73800

50.  $416 \times 38$

15808

51.  $293 \times 54$

15822

52.  $704 \times 25$

17600

53.  $352 \times 73$

25696

Division

Divide. 9

1.  $9 \overline{)81}$

9

2.  $7 \overline{)56}$

8

3.  $3 \overline{)21}$

7

4.  $5 \overline{)25}$

5

5.  $4 \overline{)32}$

8

6.  $72 \div 8$

9

7.  $6 \div 1$

6

8.  $0 \div 3$

0

9.  $30 \div 10$

3

10.  $54 \div 6$

9

11.  $8 \overline{)35}$

4 R3

12.  $6 \overline{)22}$

3 R4

13.  $4 \overline{)36}$

9

14.  $9 \overline{)58}$

6 R4

15.  $5 \overline{)44}$

8 R4

16.  $5 \overline{)450}$

90

17.  $7 \overline{)560}$

80

18.  $9 \overline{)360}$

40

19.  $3 \overline{)270}$

90

20.  $2 \overline{)160}$

80

21.  $6 \overline{)60}$

10

22.  $4 \overline{)48}$

12

23.  $3 \overline{)63}$

21

24.  $5 \overline{)55}$

11

25.  $2 \overline{)86}$

43

26.  $7 \overline{)84}$

12

27.  $6 \overline{)90}$

15

28.  $3 \overline{)45}$

15

29.  $5 \overline{)85}$

17

30.  $7 \overline{)91}$

13

31.  $8 \overline{)92}$

11 R4

32.  $3 \overline{)71}$

23 R2

33.  $6 \overline{)74}$

12 R2

34.  $5 \overline{)83}$

16 R3

35.  $4 \overline{)70}$

17 R2

Divide. 71

36.  $9 \overline{)639}$

71

37.  $7 \overline{)350}$

50

38.  $5 \overline{)200}$

40

39.  $6 \overline{)366}$

61

40.  $3 \overline{)189}$

63

41.  $2 \overline{)138}$

69

42.  $8 \overline{)496}$

62

43.  $5 \overline{)420}$

84

44.  $9 \overline{)711}$

79

45.  $4 \overline{)392}$

98

46.  $6 \overline{)537}$

89 R3

47.  $3 \overline{)256}$

85 R1

48.  $5 \overline{)408}$

81 R3

49.  $7 \overline{)591}$

84 R3

50.  $8 \overline{)470}$

58 R6

51.  $9 \overline{)990}$

110

52.  $2 \overline{)614}$

307

53.  $4 \overline{)848}$

212

54.  $3 \overline{)693}$

231

55.  $2 \overline{)826}$

413

56.  $5 \overline{)580}$

116

57.  $4 \overline{)856}$

214

58.  $2 \overline{)492}$

246

59.  $3 \overline{)954}$

318

60.  $6 \overline{)690}$

115

61.  $7 \overline{)861}$

123

62.  $6 \overline{)834}$

139

63.  $3 \overline{)789}$

263

64.  $5 \overline{)920}$

184

65.  $2 \overline{)758}$

379

66.  $4 \overline{)631}$

157 R3

67.  $9 \overline{)992}$

110 R2

68.  $2 \overline{)753}$

375 R3

69.  $3 \overline{)867}$

289

70.  $6 \overline{)790}$

131 R4

71.  $9 \overline{)936}$

104

72.  $6 \overline{)600}$

100

73.  $4 \overline{)432}$

108

74.  $5 \overline{)550}$

110

75.  $7 \overline{)700}$

100

340

341

# Measurement







Use a ruler to measure the line segment.

1. — **5 mm**      2. — **15 mm**      3. — **8 mm**      4. — **23 mm**



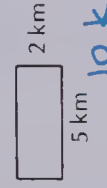
What unit would you use to measure each?

5. The width of a dime      m   mm   **mm**      km  
 6. The mass of a car      g   kg   **kg**      mL  
 7. The length of your foot      mm   cm   **cm**      m  
 8. The amount of juice in an orange      mL   mm   L  
 9. The mass of an apple      g   km   kg  
 10. The amount of water in a tub      mL   cm   L




Find the perimeter of each figure.

11.       12.       13.       14.       15.       16. 

What is the area?

17.       18.       19. 

Find the volume.

20.       21.       22. 

What time is it on the 24 hour clock? Match the best answer.

23. Wake up in morning **07:00**      A. 12:00  
 24. School begins **09:00**      B. 07:00  
 25. School is over **15:30**      C. 18:00  
 26. Supper time **18:00**      D. 15:30  
 27.      E. 9:00

# Geometry

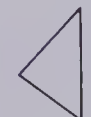



Is the object symmetrical?

1.  **yes**      2.  **no**      3.  **yes**      4.  **yes**

What solid does each object suggest?

5.  **cylinder**      6.  **pyramid**      7.  **sphere**      8.  **cone**













How many angles are there in each figure?

9.  **3**      10.  **0**      11.  **5**      12.  **4**

Use the letters **H**, **T**, and **X**.

13. Which letter has parallel lines? **H**  
 14. Which letter has perpendicular lines? **H, T**  
 15. Which letters have intersecting lines? **X, H, T**

Write the letter of the figure that is congruent to the first figure.

16.       A.       B.       C.   
 17.       A.       B.       C.   
 18.       A.       B.       C. 

Write the name of the figure that has:

19. 3 sides      20. 5 sides      21. 8 sides      22. 4 equal sides.  
**triangle**      **pentagon**      **octagon**      **square**  
 Match the picture on the right.  
 23. Which picture suggests a flip? **C**  
 24. Which picture suggests a slide? **A**



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